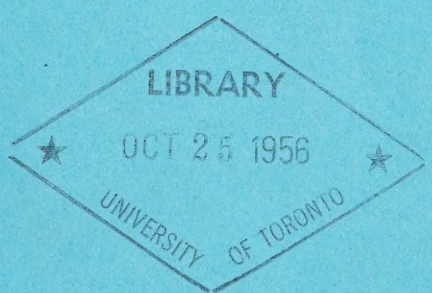
TRENDS IN LOCKER PLANTS and HOME FREEZERS

by L. E. DRAYTON



Marketing Service · Economics Division
CANADA DEPARTMENT OF AGRICULTURE

56/19

OTTAWA, JUNE 1956.

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INTRODUCTION

In many Canadian communities farmers have always endeavored to be self-sufficient with respect to meat supplies. In some areas it has been a long standing farm practice to cure pork by salting and smoking. The salting of beef is a much less common practice but many farmers have in the past butchered a steer in the late fall and relied on the Canadian winter to preserve the beef for several months.

For supplies of beef in summer farmers used to rely primarily on two sources. One of these was the periodic butchering of steers by neighbors. In many communities various farmers would butcher a steer at some time during the summer and peddle most of the meat. If enough farmers did this and the timing chanced to prove satisfactory a farm community was well supplied with beef. The second source of beef was the beef ring which systemized the timing of farm slaughter of beef animals during the summer.

There were difficulties with either peddling of beef or the beef ring in relating the supply of meat to day to day needs. Consequently, farmers sought a more flexible supply of high quality meat. In the more prosperous farming communities butcher stores were established and built up a flourishing business. However, many farmers felt that the sale of a steer did not buy them enough meat when they shopped at a butcher store.

In some farming communities cold storage plants were built, usually in association with a creamery. Farmers, accustomed to using frozen beef all winter, asked the managers of these plants to store boxes of meat for them. This service was performed, at first, primarily as a favor to a patron. In the course of time the demand for it led to systematic provision of locker storage services. Research on the preservation of foods led to improvements in the handling of frozen meats which paved the way for the specialized locker plant business. Soon after practicable facilities for year round storage of frozen foods in the home were developed in the form of farm or home freezers.

Purpose and Scope of Study.- The purpose of this study is to trace the development of the locker plant industry of Canada, describe the present distribution of locker services, and to present information and analyses that will allow readers to appraise the effects of locker plants and the associated home freezer on food marketing. Data used have been obtained from provincial government agencies administering locker plant legislation, locker plant associations, and personal interviews with locker plant operators and others interested in the industry. As there is no locker plant legislation in Quebec and the Atlantic Provinces, data presented on these areas are relatively limited. On the other hand, the provincial governments in Alberta and Saskatchewan have compiled data

on processing of foods in locker plants which cannot be matched in other provinces. Thus, the degree of completeness of the description of the industry presented varies considerably from province to province.

THE HISTORY OF THE LOCKER PLANT INDUSTRY IN CANADA

As the locker plant is a specialized type of cold storage business, its origins are found in other types of cold storage. It would probably be impossible to determine which cold storage firm first allowed some farmer to place a box of frozen meat in a corner of a room where temperatures below 32°F. were maintained. Possibly that farmer had held this meat in an oat bin for a portion of the winter and an early thaw had led to risk of spoilage.

Early Development of Locker Plants.- In 1945, origins of the locker plant industry in Alberta were reviewed as follows:

> "Locker storages originated in public cold storage warehouses and dairy plants. Refrigerated storage space was made available to farmers and producers of food who required such facilities to store their surplus perishable products. In the beginning this food was brought to the cold storage warehouse in boxes, barrels and miscellaneous containers. The cold storage warehouse made a charge for storing on the basis of so much per pound. In some cases, additional charges were made to cover the cost of withdrawals. This system was difficult for the storage operator to handle as frequent withdrawals of small quantities required considerable service. In order to overcome this difficulty compartments with doors and locks eventually were installed in the low temperature rooms and a charge was made on the basis of the space provided in these compartments rather than the weight of produce stored. The renters of these compartments, now known as lockers, were supplied with keys and allowed to place their product in the lockers or remove them at will. This was much more convenient to the renter and required very little service on the part of the operator. This type of service has been offered to patrons in a few districts in Alberta for the past 20 to 30 years. Eventually some of the operators of this original limited service type of plant, not only in Alberta but elsewhere, realized that their patrons desired additional service and that by providing these extra services they increased the patronage to their plant. Many patrons of the locker plants did not have sufficient training and experience to properly cut and wrap meat for freezing and storage, and as a consequence the establishment of these services was well received. In a short time these same operators found that other services, such as meat curing, sausage making, lard rendering and even slaughtering, had considerable appeal to their patrons. This extra service naturally required additional space and

eventually separate rooms were provided to take care of these operations."1/

No doubt a similar description of the evolution of the locker industry would be equally true of other parts of Canada, especially in dairying regions. Some of the older operators of existing public cold storage warehouses still recall the days when they had boxes of farmers' produce scattered through their plant and the difficulties associated with this type of business.

It is difficult to determine when and where such practices started or even when the transition to installation of lockers commenced. Neither was a spectacular development which attracted attention at the time. Inspection reports on locker plants to the Ontario Department of Health show the "Year of Opening". The earliest year of opening given in these reports for existing locker plants is 1922. However, there may have been plants which installed lockers at an earlier date which have since discontinued locker services. Further there is a possibility of considerable error in the date reported as "year of opening" by some of the oldest plants. It is probable that the first locker plants in some other parts of Canada appeared about the same time.

The services of the original locker plants consisted solely of the renting of space in a low temperature room. The locker renter placed either fresh or frozen food in the space thus provided and removed this food as needed. An axe or crowbar might be kept in the locker room for the use of customers in getting their meat out of their lockers.

There was a considerable demand for this type of service which appears to have grown during the depression years before World War II. Many creameries in country towns and even cities across Canada installed lockers for rental. Lockers were also built in some other cold storage warehouses. Rent charged ranged up to about $12.00 per annum. Locker sizes and shapes varied considerably. Locker storage was used mostly by farmers who slaughtered their own pigs or steers and brought in portions to be stored. However, some urban people also used the locker service.

Development of the Full Service Plant.- Meanwhile, research had led to the development of improved techniques in the freezing of foods. When a locker was packed with pieces of unwrapped warm meat, it might have taken several days for the meat to freeze through to the center. Juices ran so that the meat froze together into a solid block. Sometimes the meat started to spoil, getting a sour, rancid or other unpleasant flavor. "Freezer burn" was a common problem. This usually developed after several months of storage and was characterized by the surface of the meat becoming dry and leathery. A simple solution was found for all these problems. This solution was to vapor-proof

1/ D.H. McCallum, Dairy Commissioner, Province of Alberta, in an address entitled "Alberta's Frozen Food Locker Industry", to the Alberta Cold Storage Locker Convention, Calgary, April 16, 1945.

wrap the meat before freezing and freeze it before placing it in a locker. It was found that when meat was properly chilled before cutting, vapor-proof wrapped, quick frozen, and stored at zero degrees fahrenheit the product, after several months' storage, would be just as good as the original fresh meat.

Thus, it became apparent that a better job could be done of preserving food in lockers than many farmers were doing in their cold storage lockers. To do this better job certain facilities were desirable. A cooling room was needed to chill a carcass properly before it was cut up. Once this was provided, space and facilities for cutting and wrapping meat near the chilling room were desirable. Farmers generally recognized that it was more efficient for a skilled butcher to cut and wrap the meat than to attempt to do it themselves, especially as it would often be difficult to find a time when no one else was using the cutting room. Freezing the meat in a special quick-freeze cabinet or room before placing it in a locker provided assurance that each cut was completely frozen within a day of wrapping. When all food brought into the locker room was pre-frozen, temperatures throughout that room became more uniform. A locker plant providing such services came to be known as a "full service" locker plant in contrast with the earlier "partial service" type.

Provision of these added services in a cold storage warehouse entailed the use of much more space for the locker plant and the employment of skilled butchers. Moreoever, there was no certainty that their customers could be convinced that the added service was worth the added cost. Many farmers appeared to be well satisfied with existing services; others were convinced that frozen meat was a poor product, and would be reluctant to try it again.

For the retail butcher, however, these developments provided a new opportunity. If he built a locker plant he could secure revenue from cutting, wrapping and storing meat for families who sought to supply their own rather than buy it from a butcher. Thus, as knowledge of the new technique of handling frozen meat spread, many retail butchers, became interested in the establishment of full service locker plants.

The Formation of Locker Plant Associations.- Those operating full service locker plants felt a need for the formation of association for a variety of reasons. In the first place, they were treading new unfamiliar ground and could learn much from the experience of others in the same business. Secondly, a need of standards for the locker plant industry was felt. They were providing a much more extensive service than the renting of cold storage space. To sell this service, it was necessary either to convince the public that it was worth the added cost or to prevent provision of the cheaper competitive service. If standards could not be established and maintained, poor services would give frozen foods a bad reputation in many areas, with the result that good services would be difficult to sell. Thirdly, government action would be necessary to establish and enforce standards for the locker plant industry. An association could work more effectively to bring this about than individual locker operators.

Firms in the business of selling refrigeration and locker plant equipment also had an interest in the formation of locker plant associations. The conventions of such associations would provide a good advertising medium. Also, the establishment of sound industry standards would speed growth of the industry. Thus, such firms played an active role in the organization of the locker plant associations.

The first meeting of the Alberta locker plant association was held in Calgary on March 8, 1942. About the same time the Ontario association started to organize. By the end of 1946, locker plant associations had either been organized or were in the process of organization in each of the four Western Provinces. Quebec locker plant operators founded their association in 1951. No similar association of locker plant operators has yet been formed in any of the four Atlantic Provinces. One reason for this is that there are very few full service locker plants in these provinces.

The first major project of these associations was to persuade their respective provincial governments to enact legislation regulating locker plants. In Ontario and each of the four Western Provinces, they soon secured legislation in accordance with their general recommendations. The Quebec association has not been able to convince the government of that province that such an act is necessary.

With standards established, the role of the locker plant associations became largely one of education of locker plant operators and the maintenance of good fellowship within the industry. Annual conventions are held in each province to discuss industry problems. Scope and nature of services provided, charges for them and problems of efficiency in operation are discussed in these conventions. Successful operators describe their business. Distributors of locker plant supplies exhibit their products. The associations in the Western Provinces arrange their convetions in a sequence so that the expenses of bringing in a feature speaker may be shared and exhibitors may move from convention to convention with a minimum of expense.

Most of the associations circulate news letters among their members between conventions. Some of the locker plant associations have also become wholesale suppliers to their members. The Alberta association started to distribute sawdust and certain other supplies to its members in the first year after its organization. During the past three or four years they have also distributed frozen foods other than meats. To facilitate such frozen food distribution this association operates a frozen food warehouse.

None of the other associations distributes frozen foods although those in British Columbia, Saskatchewan and Manitoba are all seriously considering entering this field. The Saskatchewan and Manitoba associations do distribute some supplies to their members.

Legislation.- The first locker plant act in Canada was passed by the Alberta legislature in 1944. Manitoba followed suit in 1945 and Saskatchewan in 1946. The frozen food locker acts of the three Prairie

Provinces are very similar in content and there can be little doubt that the wording of the Manitoba and Saskatchewan acts was influenced by the prior Alberta act. All three acts defined "a frozen food locker plant" as "an establishment in which space by means of individual lockers or otherwise is rented or otherwise made available to persons for storage of frozen food." The Saskatchewan act, however, adds the words "but does not include one used as an adjunct of a fur farm by the owner or proprietor thereof", to this definition.

> The key clause of each act provides that: "no person shall carry on in the province, the business of a frozen food locker plant unless he is the holder of subsisting license (permit) issued pursuant to this act, authorizing such person to carry on such business nor shall any person who is the holder of a license carry on such business at any place other than the place specified in the license".

In each province, a written application accompanied by the fee is required before the license or permit is issued and licenses are not transferrable except with the approval of a minister of the government. Local authorities are barred from issuing any license or permit to carry on the business of a frozen food locker plant, until the provincial license has been issued. In each of the Prairie Provinces, the license to operate a locker plant may be revoked, suspended or cancelled "if in the opinion of the minister, any of the provisions of this act or any regulations made thereunder, have been contravened by the licensee" or his employees. Further, approval by the minister of site and plans and specifications of the building of any new locker plant is required.

In Alberta and Saskatchewan this legislation is administered by the Department of Agriculture but in Manitoba it is administered by the Department of Health and Public Welfare.

Ontario and British Columbia did not adopt locker plant acts of this type. In 1944, Ontario amended its Public Health Act permitting the enforcement of regulations governing locker plants drafted under that Act. In 1945 a further amendment to the Public Health Act authorized the licensing of locker plants. In British Columbia no special legislation was passed, provisions in the Health Act concerning "cold storage warehouses" being deemed adequate legal basis for regulation of frozen food locker plants.

Regulations.- As the foregoing summary indicates, legislation in each province provides the broad framework for the regulations governing the building and operation of locker plants. Without the detail of the latter, the legislation would have little meaning in terms of establishment of standards. The first Alberta locker plant regulations came into force during 1944. The Manitoba regulations were published on March 9, 1946, while those in Ontario and Saskatchewan came into effect later the same year. In British Columbia locker plant regulations became effective early in 1947.

The regulations governing locker plants in these provinces vary considerably in arrangement and wording, but less in general substance. However, the regulations in Ontario and British Columbia are much more detailed with respect to matters of sanitation and temperature control than are those of the Prairie Provinces. The following requirements are common to the regulations of all five provinces:

1. a license shall be required to operate a frozen food locker plant;

2. all food shall be frozen before being placed in lockers;

3. all food shall be inspected by the locker operator or his employees before being placed in lockers;

4. all meat shall be packaged in water-vapor resistant wrappings and other foods packed in suitable containers before being placed in lockers;

5. no tainted or spoiled food shall be accepted by or stored in a locker plant;

6. food not for human consumption, such as animal foods, hides, skins and pelts, shall not be handled or stored in any part of a locker plant used for food, or come in contact with equipment used for handling food;

7. temperatures for chilling and ageing rooms, sharp freeze cabinets and locker rooms are specified with tolerances. (There are some differences between the various provinces in these specifications. In general 35^{o}F. is to be maintained in chilling or ageing rooms, 10^{o}F. below zero in sharp freeze cabinets and 0^{o}F. in locker rooms with a tolerance of about 10^{o}F. for short periods when food is being brought in or taken out;)

8. thermometers of specified types shall be installed in each refrigerated room. (Recording thermometers are required in each locker room in Ontario and British Columbia but are not mandatory in the Prairie Provinces).

Other regulations are concerned largely with building location and structure and sanitary conditions. The regulations on location and structure are a safeguard against the building of poorly located, poorly designed locker plants but do not relieve those who build new locker plants of the necessity of using good judgment in these matters. The sanitary regulations provide safeguards to the locker plant customer that his food is handled in a safe sanitary manner and will not become contaminated while in the locker plant. Other regulations, such as requirements for insurance and for identification of customers' packages, are designed to protect both locker plant operators and customers from losses.

EXTENT OF INDUSTRY

From insignificant beginnings sometime in the 1920's, or possibly earlier, the Canadian locker plant industry has grown to one of over 1,200 plants distributed all across Canada (Table 1).

Table 1.- Locker Plants in Canada by Province, 1953, as Related to Total Population

Province	Locker plants a/	Total population	Population per plant
	- number -		
British Columbia	124	1,230,000	9,900
Alberta	153	1,002,000	6,500
Saskatchewan	211	861,000	4,100
Manitoba	103	809,000	8,000
Ontario	519	4,897,000	9,400
Quebec	82 b/	4,269,000	55,400
New Brunswick	9	536,000	60,000
Nova Scotia	9	663,000	74,000
Prince Edward Island	9	106,000	12,000
Newfoundland	3	383,000	127,000
	1,222		

a/ Includes all cold storage warehouses in which lockers are rented to the general public.
b/ Includes 47 cold storage fish warehouses each of which has a few lockers installed.

Over 40 per cent of Canada's locker plants are situated in Ontario. Each of the four Western Provinces is the location of eight to 17 per cent of the locker plants. On the other hand, none of the five provinces east of Ontario has many locker plants. There may, however, be more locker plants in this part of Canada than are reported as, in the absence of licensing legislation, there is no record required of the existence of a locker plant. Many such businesses are reported in the Census of Industry as retail stores, creameries and general cold storage warehouses, since locker operations are often subsidiary to these classes of business.

When the number of locker plants is related to population, it will be noted that the highest concentration of locker plants occurs in Saskatchewan, followed by Alberta and Manitoba. On this basis Prince Edward Island shows up as being better served by locker plants than are the other provinces east of Ontario.

Growth of the Industry.- As indicated by the present number of locker plants, there has not been any period of phenomenal growth of

the locker plant industry in Quebec and the Atlantic Provinces. In all other provinces this industry expanded very rapidly from 1945 to 1950; probably at least 75 new locker plants were built each year (Table 2). The rate of growth has tended to decline since 1950, with very few new plants being opened in most provinces.

Table 2.- Number of Locker Plants in Certain Provinces, Each year - 1945-1953 a/

Year	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario	Total five provinces
			- number -			
1945	n.a.	61	n.a.	14	n.a.	n.a.
1946	n.a.	83	42	32	340 b/	n.a.
1947	n.a.	97	73	64	428 b/	n.a.
1948	76	118	94	74	440 b/	802
1949	98	134	131	79	478 c/	920
1950	99	141	164	86	521 c/	1,011
1951	105	146	176	99	515 c/	1,041
1952	107	148	200	101	517 c/	1,073
1953	124	153	211	103	519 c/	1,110

a/ As reported by licensing agency in each province. Consequently, figures are not for the end of the calendar year, but rather for the end of reporting years which vary from province to province.
b/ Number of applications received for locker plant licenses. Number of plants in operation may have been slightly greater.
c/ Number of plants known to be in operation.
n.a. - not available.

Number of Lockers.- Only the three Prairie Provinces prepare reports showing the number of lockers in locker plants on a regular annual basis. However, data are available on the number of lockers in Ontario and British Columbia locker plants at two or three dates.

In the Prairie Provinces where the most complete data are available the size of locker plants has been increasing as well as the number of plants (Table 3). This increase in average size has arisen primarily from expansion of established plants. Many locker plant operators build a plant which will house a considerably greater number of lockers than are required immediately after construction is completed. Then they install lockers as required. Thus, the number of lockers installed in the plant will gradually increase as the locker operator succeeds in building up the demand for his services in the community.

There are some exceptions to this. Some operators apparently have installed more lockers than they could rent and later removed the surplus lockers to make the space available for other uses. Others have experienced a decline in demand for locker space since 1952, but at the same time have felt a need for added bulk storage space in connection with the merchandising of frozen foods.

Table 3.- Lockers in Frozen Food Locker Plants in the Prairie Provinces, 1947-1953

Year	Frozen food lockers				Locker plants[c]	Lockers per plant
	Alberta[a]	Saskatchewan[a]	Manitoba[b]	Total three provinces	Total three provinces	
1947	28,109	16,682	15,673	60,464	223	271.1
1948	35,571	25,493	22,928	83,992	284	295.7
1949	44,020	37,601	23,888	105,509	344	306.7
1950	48,647	48,855	27,113	124,615	393	317.1
1951	50,316	54,545	30,962	135,823	421	322.6
1952	51,617	61,893	32,097	145,607	449	324.3
1953	52,999	69,751	33,408	156,158	467	334.4

a/ Officially reported figures.
b/ Capacity given in application for permit. This application is made out at beginning of calendar year for old plants and prior to construction for new plants.
c/ There are some discrepancies from Table 2, as in Manitoba the count of lockers installed was made at a different date from the official count of locker plants.

There is a close similarity in average locker plant size among the Prairie Provinces. In 1953 the average sizes were: Alberta, 345 lockers; Saskatchewan, 331; and Manitoba, 324.

In British Columbia 86 of the 99 licensed locker plants in 1950 had a total of 46,000 lockers or 535 per plant. By December 1953, 121 locker plants in this province had a total of 56,415 lockers or 466 lockers per plant. This substantial decline in average plant size arose out of installation of "warm room units" by established store businesses during 1952 and 1953. These warm room units are so named because they may be installed in a store without the construction of a special refrigerated building. They consist of 96 lockers per unit and the usual installation is one unit.

An analysis of locker plant size made in Ontario in January 1950 revealed that there were 169,039 lockers, or an average of 346 per plant, in the 488 plants for which these data were available. A similar analysis was made in January 1954. By then there were 190,976 lockers in 518 plants or 369 per plant. Thus, it is evident that there has been a similar growth in the size of locker plants in Ontario to that in the Prairie Provinces, at least since the end of 1949.

Data on size are available for only 47 of the locker plants in Quebec, and these are not typical in that the storages concerned are operated as services to fishing communities rather than as profit making businesses. They have a total of 3,677 lockers or an average of 77 each. It is probable that the remaining locker plants in Quebec are of similar size to those in other provinces.

The foregoing data provide a basis for estimating the total number of lockers in Canadian locker plants. The 1,153 plants for which data on the number of lockers in 1953 are available had a total of 407 thousand. The remaining 69 locker plants in the rest of Canada probably represent another 23 thousand lockers. Thus, there were about 430 thousand lockers available for rental in frozen food locker plants in Canada at the end of 1953.

Data on number of lockers rented are less adequate than those on lockers installed. Changes in the number of lockers installed in a given plant occur only occasionally but the number rented may change daily. Such data as are available indicate a normal occupancy of 90 to 95 per cent of the installed lockers. Thus, about 385 thousand lockers probably were rented in Canada at the end of 1953.

The number of families actually using locker services at any given time is lower than the number of lockers rented. There are relatively few instances of two families sharing the use of one locker, but it is fairly common for one family to rent two or more lockers at least for short periods of time. Instances have been reported of one family renting as many as five lockers.

It is probable that the average size of family renting lockers is somewhat higher than the national average for the following reasons: (1) locker services are used more by rural than by urban families and rural families average larger; (2) the use of a locker is more valuable to a large than to a small family. Consequently, very small families are less likely to rent lockers than are medium-sized or large families. Average family sizes in 1951 were 3.5 persons for urban families and 4.1 for farm families. Allowing for the facts that usually a few lockers are not in use and that some families use more than one locker, it would appear to be a reasonable approximation that 3.5 persons use locker services for every locker installed.

Table 4.- Probable Percentage of Population Using Locker Plant Services in Various Provinces, 1953

	Population 1953	Lockers installed 1953	Estimated persons using locker plant services	
	- number -		- number[a] -	- % of population -
British Columbia	1,230,000	58,279 [b]	204,000	17
Alberta	1,002,000	52,999	185,000	18
Saskatchewan	861,000	69,751	244,000	28
Manitoba	809,000	33,408	117,000	14
Ontario	4,897,000	190,979	668,000	14
Quebec and Atlantic Provinces	5,957,000	22,000 [c]	77,000	1
All ten provinces	14,756,000	419,872	1,495,000	10

a/ Lockers installed multiplied by 3.5 and rounded to nearest thousand.
b/ Assumes that four plants for which number of lockers is not available are average size for the province, namely 466 lockers each.
c/ Rough approximation.

On the basis of the assumption that 3.5 persons use locker services for each locker installed about ten per cent of Canada's population was using locker services in 1953 (Table 4). This proportion varied from as low as one per cent in the Atlantic Provinces and Quebec to as high as 28 per cent in Saskatchewan.

Volume of Processing.- Data on the volume of food processed by or stored in locker plants are available only for the three Prairie Provinces. The Departments of Agriculture in Alberta and Saskatchewan require each locker plant to submit a monthly report on the volume of food processed. These reports provide a breakdown by class of food. Co-operation by locker operators in supplying these data has been good. The Manitoba Department of Health requires each locker operator to report his volume of processing during the preceding year when applying for his annual permit. Most plants submit only a round estimate in tons, and there may be considerable error in these data. Many locker operators in other provinces do not keep any records of quantities of food put in their lockers.

Table 5.- Total Food Processed per Locker Installed, Prairie Provinces, 1946-1953

Year	Alberta a/	Saskatchewan a/	Manitoba b/
	- pounds per locker -		
1946	231	n.a.	182
1947	277	233	277
1948	292	251	272
1949	283	262	260
1950	265	246	232
1951	275	280	266
1952	325	354	255
1953	298	302	256

a/ Values arrived at by dividing volume of food processed by lockers installed as reported by provincial Department of Agriculture.

b/ Some plants did not report volume of food processed. These figures are based on those that did. Number of lockers used is number shown on application for permit which during periods of expansion would exceed number actually installed during processing period used.

Processing per locker installed varied considerably among the three Prairie Provinces and from year to year 1/ (Table 5). Alberta appears to have the largest volume processed per locker installed in most years, followed by Saskatchewan and then Manitoba. The foot-and-mouth disease

1/ The data of Table 5 are per locker installed. Alberta and Saskatchewan Government reports show processing per locker rented for 12 months which is ten to 20 per cent higher in most years as the average number of lockers installed during each was lower than the number of lockers installed at the end of the year and five to ten per cent of installed lockers have usually been empty.

outbreak may have been responsible for the sharp increase in processing per locker during 1952 in Alberta and Saskatchewan. Less than 300 pounds per locker installed, possibly about 275 pounds, would appear to be a normal level of processing. If this were the average volume of processing in all Canadian locker plants in 1953 about 115 million pounds of food passed through Canadian locker plants that year.

Well over half of this volume of food probably was various classes of meat. In Alberta in 1953, 79.3 per cent of the food handled by locker plants was fresh meat and 8.1 per cent cured meat. The latter was not necessarily frozen but was cured on a custom basis by or for the locker plant operator as a service associated with the locker business. In Saskatchewan, meat accounts for even a larger proportion of the processing by locker plants, fresh meat amounting to 84 per cent and cured meat to six per cent in 1953. However, it is reasonable to expect that meat would dominate the locker plant business in these two provinces to a greater extent than in any other section of Canada. Saskatchewan, in particular, has very limited areas of commercial fruit and vegetable production. In large sections of the Prairie Provinces climatic conditions discourage farmers from attempting to produce much of their own fruit and vegetable requirements. Many locker plants in British Columbia and Ontario are in or near commercial fruit and vegetables areas. Consequently, it is probable that less than 80 per cent of the food processed in locker plants in these provinces is fresh and cured meat. Nevertheless, interviews in these provinces indicate that even in them, well over half the food stored in locker plants is meat.

If 80 per cent of the food processed in all Canadian locker plants were meat in 1953, this would represent 92 million pounds or between four and five per cent of the meat consumed in Canada.

Seasonal Variations.- The only available data on the timing of locker plant processing throughout the year are from Alberta and Saskatchewan. In Alberta there has been a fairly consistent seasonal pattern in the volume of locker plant processing since 1948 (Table 6).

In each year, except 1952, November and December were the two most active months for processing of foods by locker plants. On the other hand the slackest months have been either February or January. Throughout the rest of the year the processing work load has been fairly stable for Alberta locker plants with some tendency for April and August to be relatively busy months.

Table 6.- Variations in Seasonal Pattern of Food Processing by Alberta Locker Plants, 1948-1953

Month	Year[a] 1948	1949	1950	1951	1952	1953
	- per cent of total food processed during year -					
December	9.7	9.0	9.8	10.1	7.6	11.6
January	8.6	6.7	4.6	6.0	6.0	7.0
February	4.6	5.4	7.9	5.3	7.6	7.1
March	6.5	9.3	8.0	5.6	8.1	7.3
April	7.9	9.3	9.4	9.6	9.7	8.7
May	8.4	7.6	8.1	8.8	8.6	7.4
June	8.7	7.9	7.9	8.1	8.5	7.2
July	8.6	7.2	7.4	7.4	8.0	7.5
August	9.5	8.2	9.7	9.8	9.2	8.6
September	8.2	7.9	7.8	9.3	8.2	8.4
October	8.0	9.0	9.1	8.7	7.6	8.2
November	11.3	12.5	10.3	11.3	10.9	11.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

a/ Year used begins December 1, to correspond with practices of Alberta office.

That November and December were the months of highest processing load was even more noticeable in Saskatchewan than in Alberta 1/ (Table 7). This pattern is somewhat more marked in the south than in the north half of each province. As in Alberta, April and August are relatively busy months for Saskatchewan locker plant operators.

An analysis was made of the seasonal pattern of processing of specific products in 1952. This revealed that the processing of products which are handled in relatively small volumes by locker plants varies much more sharply from month to month than that of meat. The processing of locally grown fruits and vegetables in Alberta and Saskatchewan is virtually limited to the three summer months. Consequently, the relative lightness of the processing load found in the summer months in Alberta and Saskatchewan may not occur in areas more suitable for fruit and vegetable production.

The processing of game birds and animals is virtually confined to the fall months and helps to make the season busy. Poultry, however, is a larger factor in making the fall a busy season for the locker plant operator. The volume of poultry processed is several times as large as that of game and 60 per cent of the poultry received by a representative sample of Alberta and Saskatchewan locker plants during 1952 was processed in the three fall months.

As receipts of the foregoing groups of products by locker plants

1/ Only 1953 data are used for Saskatchewan as such data are not available for that province prior to 1952 and Table 6 suggests that 1952 was abnormal for locker plant operators.

are concentrated in the last six months of the year it follows that the seasonal pattern of meat processing departs somewhat from that of all processing. Unfortunately, the year for which detailed products data were obtained, 1952, may have had an abnormal meat processing pattern in locker plants as a result of foot-and-mouth disease. In that year a representative sample of Alberta locker plants received more meat in each of the following months: April, May, June and March than in November.

Table 7.- Seasonal Variation in the Volume of Food Processed by Locker Plants, Alberta and Saskatchewan, 1953 a/

Month	Area				
	Southern Alberta b/	Central & Northern Alberta c/	Southern Saskatchewan d/	Northern Saskatchewan e/	Total
	- per cent -				
January	7.8	6.3	9.5	6.2	7.4
February	7.1	7.1	6.2	5.6	6.4
March	6.7	7.7	7.2	7.8	7.4
April	8.2	9.2	9.4	10.4	9.4
May	7.1	7.7	6.5	7.4	7.2
June	6.6	7.7	5.9	6.6	6.7
July	7.3	7.7	6.3	7.5	7.2
August	8.2	9.0	7.8	9.2	8.5
September	8.0	8.7	6.3	7.2	7.5
October	8.8	7.7	7.6	7.7	7.9
November	11.6	10.4	13.0	12.0	11.8
December	12.6	10.8	14.3	12.4	12.6
Total	100.0	100.0	100.0	100.0	100.0
	- million pounds -				
Quantity processed	6.48	8.62	9.75	9.95	34.80

a/ December 1952 to November 1953, inclusive for Alberta, Calendar 1953 for Saskatchewan.
b/ Census divisions 1-6 inclusive.
c/ Census divisions 7-16 inclusive.
d/ Census divisions 1-8 inclusive.
e/ Census divisions 9-17 inclusive.

On the basis of a similar sample of Saskatchewan locker plants, December and April were the months of largest meat receipts. Normally, receipts of meat in locker plants may well be largest in November and December, but not much greater than in April. Such a pattern could arise out of spring butchering for summer meat and fall butchering for winter wheat.

REGIONAL PATTERNS

As the foregoing data have indicated, there is considerable variation from province to province in the development and present concentration of locker plant facilities. When analysis is made on the basis of smaller units of area, such as census division, it becomes apparent that development of this industry has also been uneven within provinces.

Two measures of concentration of locker plant services will be used in the following analysis. One is the number of lockers per 100 persons of total population; the other is the number of lockers per 100 persons of rural population. Neither is ideal. The first makes the concentration of locker services appear relatively low in areas including large cities as a much smaller percentage of urban than of farm families use locker plant services. The second fails to allow for the fact that some urban families do rent frozen food lockers.

Atlantic Provinces.- Very few data are available on development of the locker plant industry in the four Atlantic Provinces. The Directory of Cold Storage Warehouses in Canada 1/ lists 30 locker plants including cold storage warehouses with locker facilities. Although it is possible that there are other locker plants in this region, it is generally agreed that there is no extensive locker plant development in any of these provinces.

Of the 30 known locker plants in the Atlantic Provinces only four -- two in Newfoundland and two in Nova Scotia -- are not in plants built for other cold storage purposes. Thus, in origin, if not in present methods of operation, most of the locker plants in these four provinces are similar to those in Ontario and the Western Provinces prior to World War II. In other words, the locker plant industry in the Atlantic Provinces has not been affected by an upsurge of full service locker plants operated either independently or as an adjunct of a food retailing business. There are still very few, if any, such plants in the Atlantic Provinces.

As a consequence, the locker plants of the Atlantic Provinces are generally in those towns where the requirements of the dairying, fruit, meat packing,or fishing industry had led to the construction of cold storage facilities.

Quebec.- Little information is available about the development of the locker plant industry in the province of Quebec. Probably, as in most other provinces, the first locker plants were built in creameries or other plants requiring cold but not locker storage facilities.

Since 1932 the Department of Maritime Fisheries has acquired and constructed a number of cold storage warehouses in fishing communities.

1/ Department of Agriculture, Ottawa, 1953.

These were established to assist the fishing industry, but space has been available for many years in these warehouses for the storage of agricultural products. By 1943 the Department had recognized a demand for locker storage facilities in some of the communities where these warehouses were established and had installed lockers in a number of them. This service has expanded until now nearly all these warehouses have a few lockers available for rental to the general public. In some instances the number of lockers installed is very small. The 47 warehouses with some lockers have a total of 3,627 lockers.

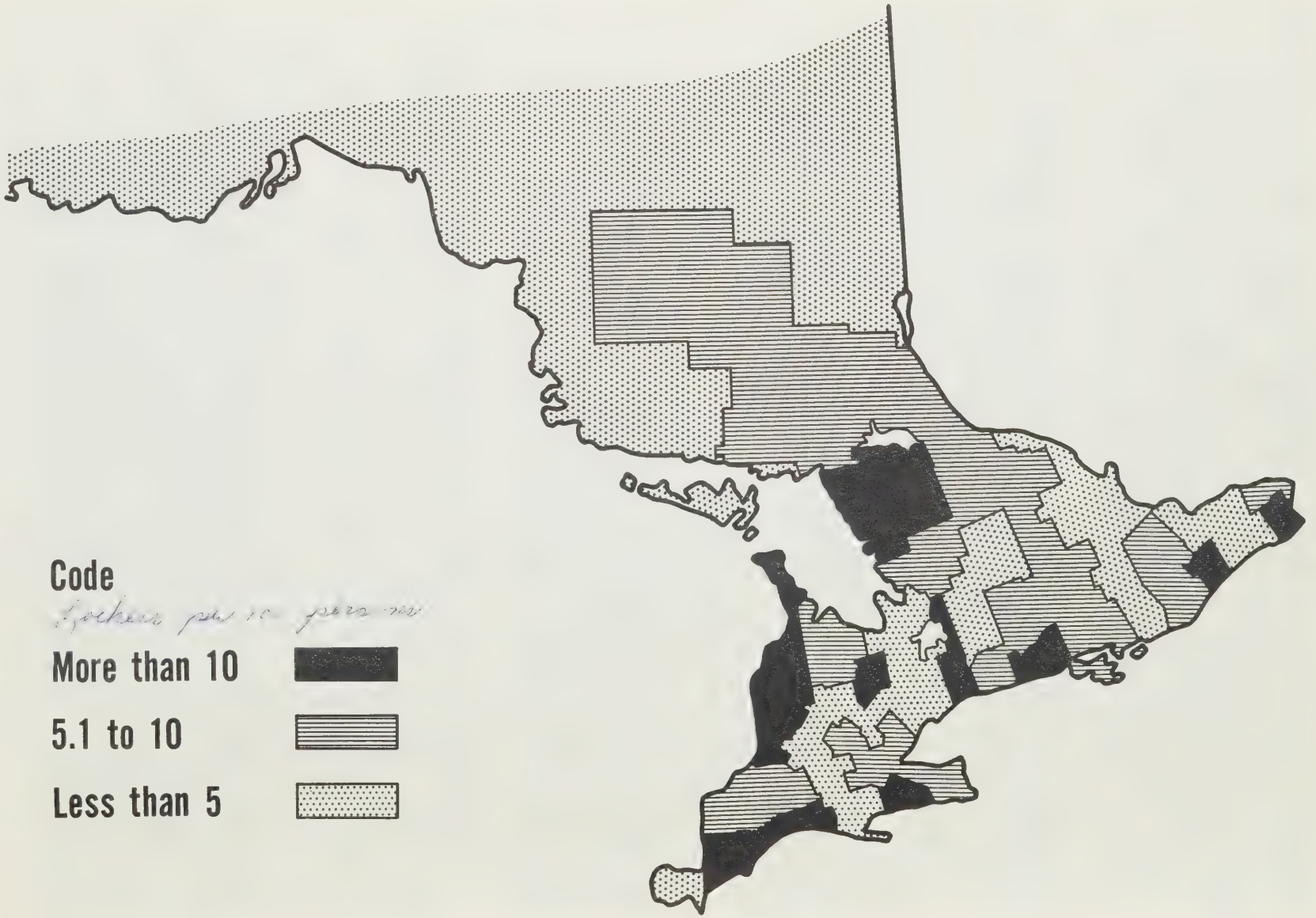
Most of the other 35 known locker plants in Quebec are members of the Quebec locker plant association. Many of them have been built as full service locker plants since the end of World War II and are similar in their operations to other locker plants all across Canada.

Ontario.- It is probable that the locker plant industry in Canada obtained its first start in Ontario and its growth in this province was fast even before World War II. Early growth was most rapid in southwestern Ontario. Although data are not available on numbers of locker plants operating in various parts of the province prior to 1946, dates of establishment of existing plants are indicative of the general distribution of locker plants in the province at various periods of time(Table 8).

In southern and western Ontario almost one-third of the locker plants operating in 1953 had commenced business in 1940 or earlier; in the rest of the province less than ten per cent of the existing locker plants were in business by that time. Nearly all of these plants commenced business as partial service locker plants, i.e., without offering cutting, wrapping and freezing services. The number of locker plants in Ontario in 1940 probably substantially exceeded the 120 indicated by Table 8, as a number of plants have since closed down.

It would appear that some of the oldest locker plants in Ontario were established in conjunction with meat markets and grocery businesses (Table 9). It is extremely unlikely that all 24 locker plants built before 1940 which are now operated in conjunction with meat markets were originally built in conjunction with dairies, creameries or cold storage businesses.

Another third of the locker plants in southern and western Ontario were opened from 1941-1945 inclusive (Table 8). By this time the concept of the full service locker plant associated with retailing services or else operated as an independent business had taken root, as at least one such plant opened in 1939. Nevertheless, much of the expansion of the industry came about through the installation of locker facilities in established cold storage plants. The operators of such plants usually found it more advantageous to rent lockers only, than to provide meat cutting, wrapping and quick freezing services as well. Provision of such services entailed the employment of a butcher.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5.1 to 10
Less than 5

Figure 1

FROZEN FOOD LOCKERS AVAILABLE RELATIVE TO TOTAL POPULATION IN THE FOUR WESTERN PROVINCES AND ONTARIO

[based on locker count 1953 and census division populations 1951]

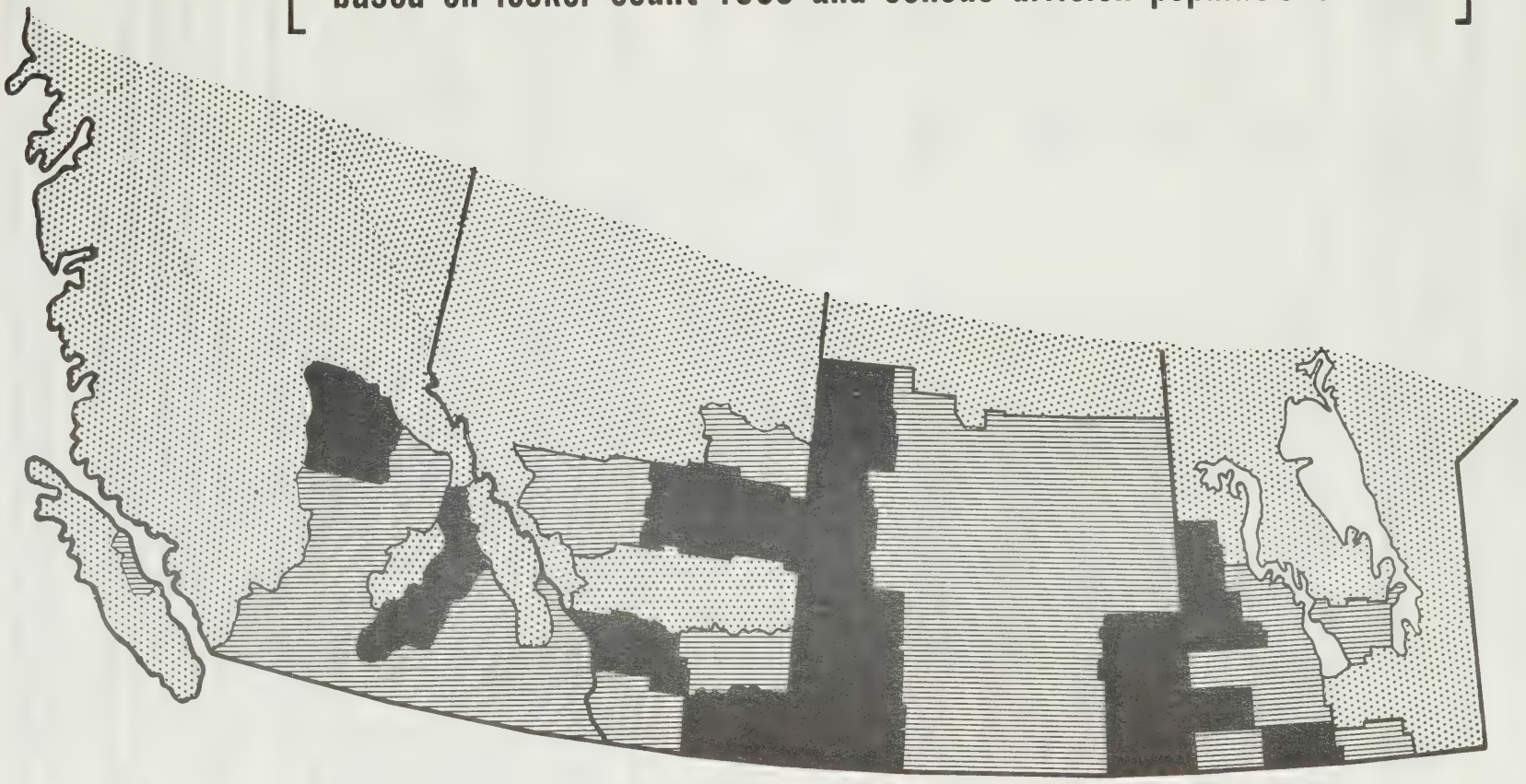


Table 8.- Date of Opening of Existing Ontario Locker Plants in Relation to Region

Region a/	Date of opening: 1940 or earlier	1941-1945	1946-1950	1951-1953	Total b/
Southern Ontario					
Number	58	61	65	9	193
Per cent	30	32	34	4	100
Western Ontario					
Number	50	54	44	9	157
Per cent	32	34	28	6	100
Central Ontario					
Number	9	28	45	2	84
Per cent	11	33	54	2	100
Eastern Ontario					
Number	3	6	45	3	57
Per cent	5	11	79	5	100
Northern Ontario					
Number	0	4	15	4	23
Per cent	0	17	66	17	100
All Ontario					
Number	120	153	214	27	514
Per cent	23	30	42	5	100

a/ These regions are used for Ontario Government agricultural statistics and each includes the counties listed below:
Southern Ontario: Brant, Elgin, Essex, Haldimand, Kent, Lambton Lincoln, Middlesex, Norfolk, Oxford, Welland, Wentworth.
Western Ontario: Bruce, Dufferin, Grey, Halton, Huron, Peel, Perth, Simcoe, Waterloo, Wellington.
Central Ontario: Durham, Haliburton, Hastings, Muskoka, Northumberland, Ontario, Parry Sound, Peterborough, Prince Edward, Victoria, York.
Eastern Ontario: Carleton, Dundas, Frontenac, Glengarry, Grenville, Lanark, Leeds, Lennox & Addington, Prescott, Renfrew, Russell, Stormont.
Northern Ontario: Algoma, Cochrane, Kenora, Manitoulin, Nipissing, Rainy River, Sudbury, Thunder Bay, Temiskaming.

b/ Excludes four plants for which opening date is not known.

By the end of World War II southern and western Ontario had well over 200 locker plants and most of these plants were of the partial service type. There were, however, a considerable number of full service locker plants and their operators were concerned about the effect on their businesses of the partial service plant.

The year 1946 brought locker plant regulations setting high operational standards in Ontario. After World War II locker plant expansion consisted

primarily of the construction of full service plants to be operated by experienced butchers. Well over half the new plants built were established in conjunction with a grocery store or meat market business.

Table 9.- Proportion of Locker Plants in Ontario Built in Different Periods Which were Operated in Conjunction with Various Classes of Businesses in 1953

Period of opening	Total plants opened		Operated in conjunction with: Ice or cold storage	Dairy or creamery	Grocery or meat mkt.	Other enterprise	Not affiliated with any other business
	No.	%	- per cent -				
1940 or earlier	120	100	8	44	20	16	12
1941 - 1945	153	100	3	14	46	20	17
1946 - 1950	214	100	3	10	60	12	15
1951 to date	27	100	4	11	56	7	22
All plants	514 a/	100	4	19	47	15	15

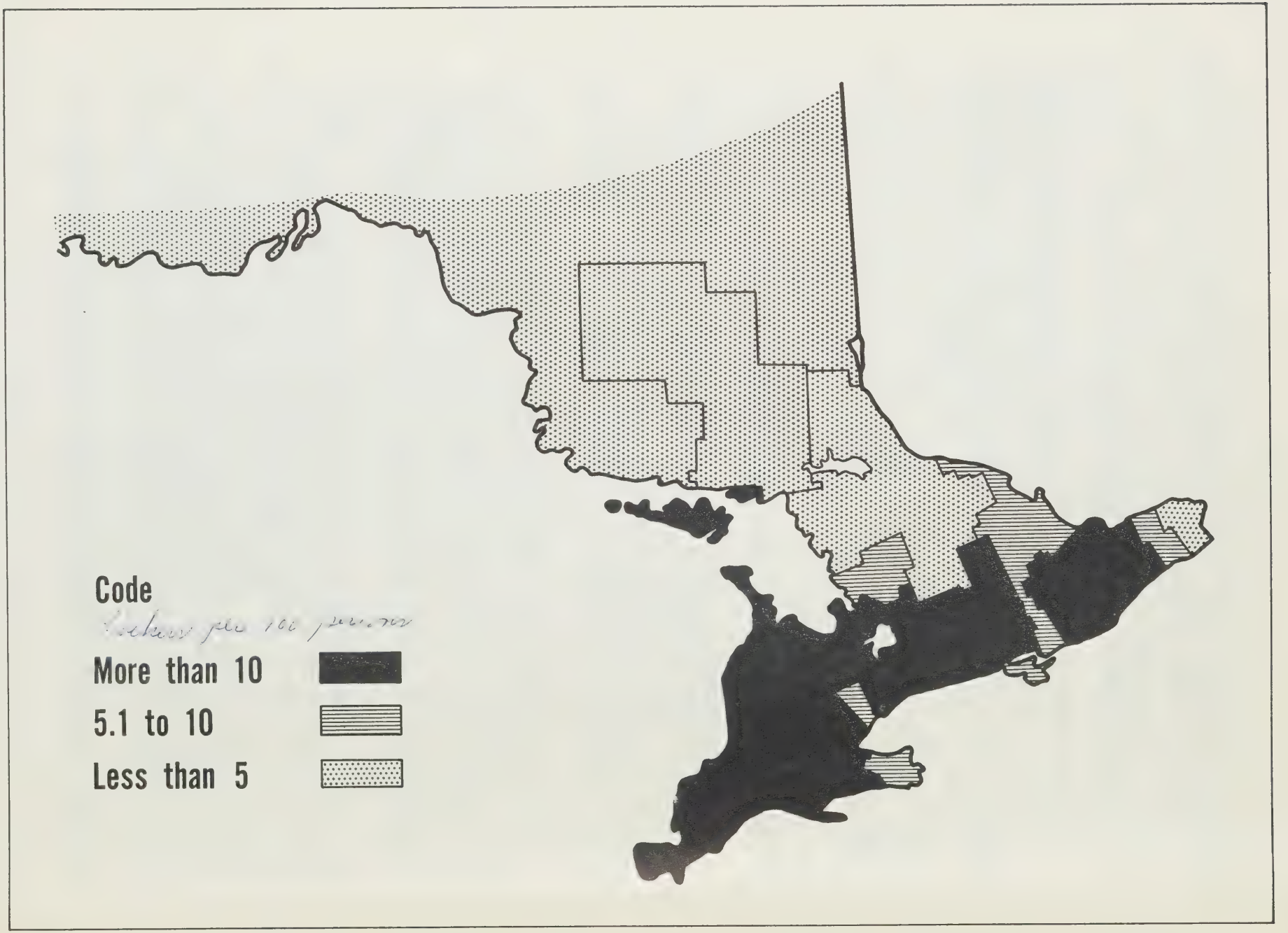
a/ Excludes four plants for which date of opening is not known.

The regulations instituted in 1946 were clearly based on the concept of a full service locker plant in which the operator received meat in the carcass, aged the meat, cut it up, wrapped it, quick-froze it and then placed it in the customer's locker. Nevertheless, the partial service type of operation was not prohibited provided that food was properly processed for freezing by someone, inspected by the locker plant operator and sharp frozen before being placed in a locker.

These requirements did mean considerable changes in operating practices for many of the older locker plants, changes that sharply increased the cost of service. In many communities locker plant operators and patrons alike resisted these changes. Many people felt that the cost of the added service did not equal its value. Meanwhile, those who had built new locker plants, designed for full service, felt that any competitors should be made to comply with the letter of the new regulations.

Locker plants of the full service type were established in various communities which had long had plants designed for partial service. This situation led to active competition, as available facilities approached or even passed the volume which could be provided at any profit to the operators. Whether or not locker plant facilities became excessive in any of the communities, a very high concentration of such facilities relative to population did develop in several counties of southern and western Ontario (Figure 1). In several counties there are more than ten lockers per 100 persons, i.e. more than one locker for every three families.

Much of southwestern and even central Ontario has more than 20 lockers per 100 rural persons (Figure 2). In some counties if only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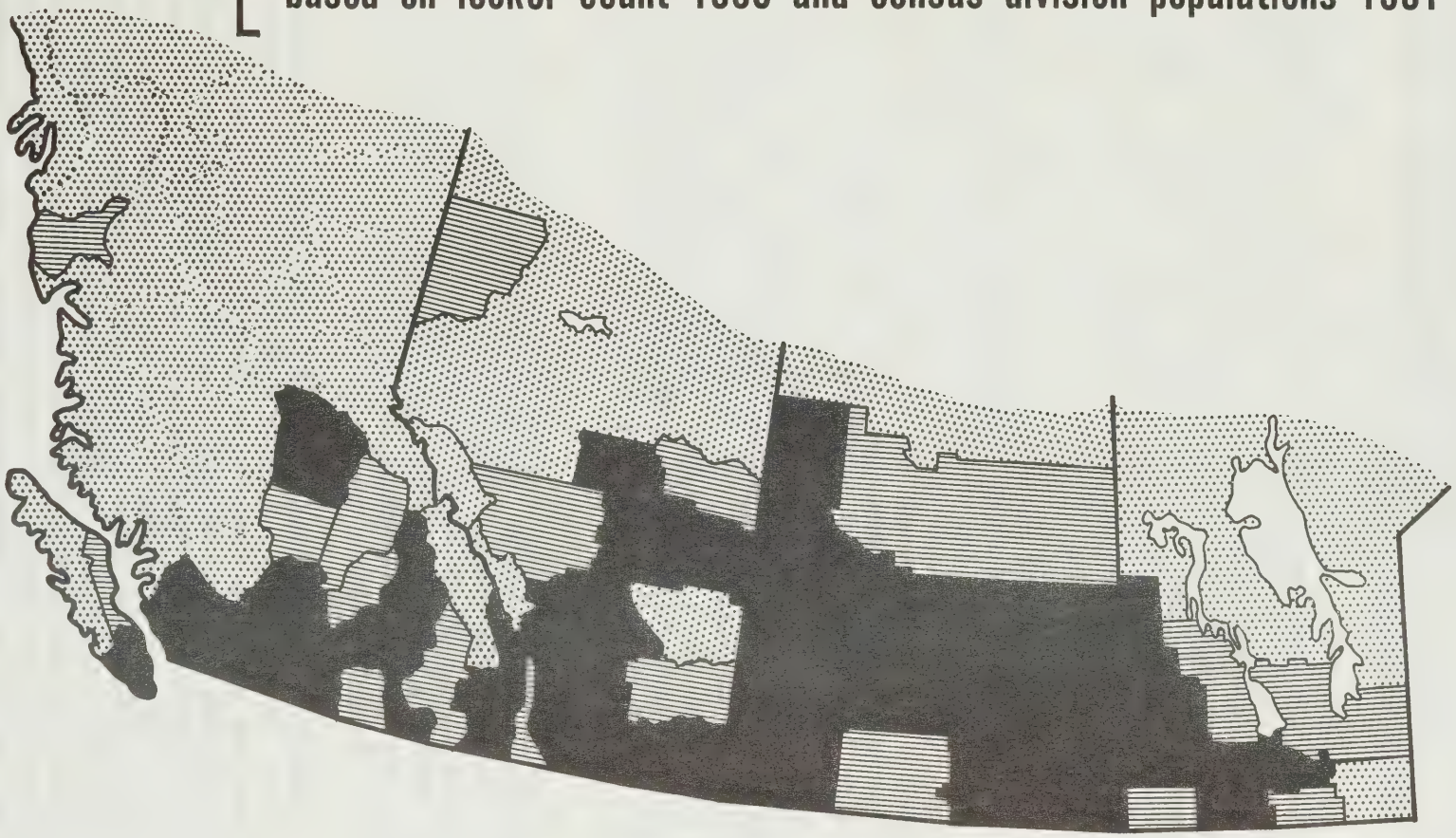
More than 10
5.1 to 10
Less than 5

Figure 2 **FROZEN FOOD LOCKERS AVAILABLE RELATIVE TO RURAL POPULATION IN THE FOUR WESTERN PROVINCES AND ONTARIO**

[based on locker count 1953 and census division populations 1951]



rural families rented lockers and every family rented exactly one locker some available lockers in existing plants would remain unrented. Thus, if facilities of the locker plant industry are to be used to capacity in these counties the slack created by the failure of some rural families to use lockers has to be taken up by rural families who already rent one locker, or by urban families.

Seven counties - Bruce, Elgin, Grey, Kent, Norfolk, Oxford and Perth - have very high concentrations of locker plant facilities relative to both rural and total population. In these counties as many locker plants have discontinued business as have opened up in the last four years, and the number of lockers installed in locker plants has declined. Various locker operators interviewed in these areas stated that they had to provide services below cost to keep their lockers rented. Prices charged for locker services are considerably lower there than in most other parts.

The fact that such heavy concentration of locker plant services has been attainable in these counties does not indicate that a similar concentration may develop elsewhere. The concentration of locker plant services relative to population is much lower in other parts of Ontario, especially the northern and eastern counties. However, differences in the economy of the different parts of the province may account for the variation in concentration of locker plant services.

Manitoba.- During the first year of the locker plant regulation in Manitoba, 1946, only 39 plants applied for permits. Some of these were new locker plants built in 1946 but at least 17 had been in operation part or all of the previous year. One quarter of them were in census division 6 which embraces the city of Winnipeg. There was also a concentration of locker plants in census division 3, southwest of Winnipeg and in census division 8, west of Brandon.

At this time, however, the locker plant industry was in a phase of rapid growth except in the northern and eastern parts of the province, as is shown by the total number of permits granted in various regions each year (Table 10). Growth continued to be rapid until 1951 but since then few new plants have been constructed. The period of expansion appears to have been a little later in the north than in other parts of the province.

Expansion dominantly took the form of establishment of locker plants in communities previously lacking this type of service. Only Winnipeg has more than two locker plants. Dauphin, Selkirk, Portage la Prairie and Brandon each has two. Each of these centers has a population over 6,000. One smaller town, Steinbach, had two locker plants in 1946 and continued to do so until the permit of one was revoked in 1953. Thus areas of competition between locker plants in Manitoba are limited to the larger centers. There may still be communities without locker plants which could benefit from the establishment of one but of the towns or villages with a population over 500 in 1951 only three have no locker plants. This suggests that the possibilities for further expansion are quite limited.

Table 10.- Locker Plant Permits Granted in Manitoba by Year, 1946-1954

Region	Year								
	1946 b/	1947	1948	1949	1950	1951	1952	1953	1954
	- number of permits granted - a/								
North and East	7	8	8	11	14	18	19	20	19
Center c/	18	28	38	39	42	46	47	48	48
Southwest d/	14	17	26	29	32	35	35	35	35
Total	39	53	72	79	88	99	101	103	102

a/ Exceeds number of locker plants in operation in most years as a new locker plant firm applies for and receives its permit before starting construction of the locker plant.
c/ Census divisions 1, 5, 9, 12 and 16.
c/ Census divisions 2, 6, 10, 13, 14 and 15.
d/ Census divisions 3, 4, 7, 8 and 11.

Actually, a pattern has developed of ten to 20 lockers per 100 rural persons in most of the western half of the province with a somewhat lower concentration of services in the eastern half except around Winnipeg (Figure 2). Many of the lockers available in census division 6 are rented to Winnipeg families. No other census division has more than 20 lockers per 100 rural persons. Brief interviews with a number of locker operators during the summer of 1953 indicated that locker facilities were then generally being used to capacity. There was considerable concern, however, about the effects of expanded sales of home freezers on prospects for the locker industry.

The permit application made to the Manitoba Department of Health includes an estimate of the quantity of food processed during the preceding year. Each year the operators of some locker plants fail to provide this information. Answers given by other locker plant operators range from less than ten to more than 1,000 pounds per locker installed. Some of these more extreme figures may have arisen from misinterpretation of the question. In any event, many of the quantities stated may be little better than guesses although undoubtedly some locker plant operators keep full records of the volume of food processed and supply accurate reports.

Despite the probable inaccuracy of many of the individual reports, averages based on large groups of reports are likely to provide reasonable approximations of actual quantities processed per locker installed. Such averages indicate that locker plants near the northern and eastern fringes of agricultural development in Manitoba tend to do less processing per locker installed than locker plants in the rest of the province (Table 11). Likewise, locker plants in the southwestern portion of the province processed the most food per locker each year except 1954. On the average for the years covered the quantity of food processed per locker installed in this part of Manitoba has been quite similar to that of adjoining Saskatchewan (See Table 5).

Table 11.- Quantity of Food Processed per Locker Installed in Manitoba Locker Plants by Region, 1946-1954 a/

Region	Year								
	1946	1947	1948	1949	1950	1951	1952	1953	1954
	- pounds -								
North & East b/	93	159	208	198	192	195	242	191	194
Center c/	183	231	270	265	216	254	227	273	299
South & West d/	206	247	295	272	265	314	313	264	233
Province	182	227	272	260	232	266	259	255	256

a/ All figures reported are averages for at least six locker plants. Reports of more than 1,000 pounds or less than 20 pounds per installed locker were excluded in arriving at these averages.
b/ Census divisions 1, 5, 9, 12 and 16.
c/ Census divisions 2, 6, 10, 13, 14, and 15.
d/ Census divisions 3, 4, 7, 8 and 11.

Saskatchewan.- Development of the locker plant industry in Saskatchewan prior to the end of World War II was similar to that in Manitoba. The cities and some of the larger towns had long established locker plants of the partial service type. In many communities, there was an interest in building new locker plants of the full service type but often construction was delayed because of wartime restrictions and expected difficulties in securing equipment and building materials.

With the institution of government regulation of locker plant services some of the old partial service plants discontinued their locker business rather than provide additional services. Meanwhile, numerous new plants were built. During 1945 and 1946 this new construction occurred mainly in the area near and south of Regina and in the northeastern part of the province.

An average of over 30 new locker plants commenced business in Saskatchewan each year from 1946 and 1950 inclusive. Focal areas of expansion for the industry were not marked and shifted from year to year after 1946. Since 1950, the locker plant industry has continued to expand in all parts of the province, although at a somewhat reduced rate.

Actually, expansion of plants after their initial construction has been a major source of growth in the locker industry in Saskatchewan (Table 12). Many plants were built with more space in insulated rooms which could be held at zero degrees fahrenheit than immediate requirements made necessary. In such instances, expansion was mainly a matter of installing additional lockers. In other instances, rooms intended for other purposes were converted or else additional rooms were built on the plant. More added locker space came from new locker plants built in 1949 and 1950 than in the three years 1951-1953. Probably a major reason for this is that the industry is approaching its limit

in expansion to new towns and villages. There were only nine towns and villages in Saskatchewan with populations of over 500 that did not have a locker plant by the end of 1953. Beyond this future expansion into new communities would need to come in the 400 Saskatchewan towns and villages with populations under 500. Of these, over a quarter already have a locker plant. Many others are so very small that their trading communities would offer poor prospects for locker plant businesses. Thus, although some further expansion of the locker plant industry into new communities may occur, this type of expansion is definitely limited.

Table 12.- Expansion of the Locker Plant Industry in Saskatchewan 1946 - 1953

Regions	Lockers installed 1953 [a]		Proportion of lockers from new plants built [b]				Proportion of lockers from expansion in established plants
			Before 1947	1947-1948	1949-1950	1951-1953	
	No.	%	- per cent -				
Southeast [c]	21,403	100	20	12	19	13	36
Southwest [d]	11,756	100	12	16	21	14	37
Northeast [e]	13,183	100	17	5	25	19	34
Northwest [f]	21,835	100	14	15	21	16	34
Province	68,177	100	16	13	21	15	35

[a] Locker plants at Big River and Buffalo Narrows are excluded for lack of data.
[b] Based on number of lockers reported when first license secured in plants opened before 1946. Otherwise number of lockers installed at or near the date the firm commenced business.
[c] Census divisions 1, 2, 5 and 6.
[d] Census divisions 3, 4, 7 and 8.
[e] Census divisions 9, 10, and 14.
[f] Census divisions 11, 12, 13, 15, 16 and 17.

Actually most of Saskatchewan now has five to ten lockers per 100 persons of total population and ten to 20 lockers per 100 persons of rural population (Figures 1 and 2). This concentration parallels that found in the adjoining provinces.

There are more than one locker per farm family in those census divisions which include Regina, Saskatoon and Moose Jaw. The relatively large number of non-farm families, some of whom rent lockers, makes this possible in these areas without giving rise to serious difficulties in renting lockers. At the other extreme there are over two farm families per locker in census division 16, an area which is at the northern fringe of agricultural development. Across the remainder of the province there is between one

and two farm families per locker available for rental. Thus existing facilities, except in the larger cities, could easily be utilized by farm families alone.

Detailed data on the volume of food processed in Saskatchewan locker plants are available for 1952 and 1953. These data indicate that the volume of food processed per locker varied considerably among census divisions in these two years (Table 13). In both years the volume of food processed per locker was highest in the southeast corner of the province and the region north of Saskatoon. These two areas include all seven of the census divisions in which over 320 pounds of food were processed per locker installed in 1952, and seven of the eight divisions in which over 300 pounds of food were processed per locker in 1953.

The volume of food processed per locker declined by 31 pounds from 1952 to 1953 for the province of Saskatchewan as a whole. The extent of this decline in 1953 varied considerably by region. In some areas it was almost 20 per cent but in others it was negligible. Indeed, the volume of food processed per locker installed in the southwest corner of the province, i.e., census division 4 increased almost ten per cent from 1952 to 1953. In two other census divisions in the western part of the province (8 and 12) the amount of meat processed per locker increased, but these increases were offset by decreases in the processing of poultry, fish and game.

Although conditions arising out of the foot-and-mouth disease outbreak may have been the principal cause of the abnormally high volume of food processed by locker plants in 1952, other factors appear to have contributed to the decline in 1953. The volume of poultry, fish and game declined seven pounds or 35 per cent. Some decline in the processing of these products occurred in all parts of Saskatchewan. Poultry accounted for most of this change. In fact, the quantity of fish and game processed per locker increased slightly in some areas. Poultry meat prices were considerably higher during most months of 1953 than in the corresponding months of 1952. This situation encouraged farmers to ship poultry rather than slaughter and freeze it for their own use and discouraged other locker plant patrons from buying poultry meat for storage.

The quantity of fruits and vegetables frozen per locker installed increased about ten per cent from 1952 to 1953 for the province as a whole. There were larger changes in some areas. In the four most northerly census divisions the increase in the quantity of fruits and vegetables processed per locker installed was 41 per cent.

Nevertheless, fruits and vegetables remained a rather insignificant portion of the locker plant business in all parts of the province. Even in census division 17, where the volume per locker was greatest, they accounted for only three per cent of the food processed in locker plants in 1952 and for five per cent in 1953. In most areas fruits and vegetables accounted for only one to two per cent of this business.

Table 13.- Quantity of Various Classes of Foods Processed per Locker in Saskatchewan Locker Plants, by Census Division, 1952 and 1953.

Census division	Fresh and cured meats		Poultry, fish and game		Fruits and vegetables		Other foods		Total	
	1952	1953	1952	1953	1952	1953	1952	1953	1952	1953
	- pounds per locker installed -									
1	349	324	19	17	4	6	7	6	379	353
2	330	328	25	23	9	7	3	2	367	360
3	263	236	26	19	4	4	3	2	296	261
4	231	269	29	20	6	4	1	0	267	293
5	309	263	20	17	7	6	3	3	339	289
6	267	258	30	24	5	6	1	1	303	289
7	287	285	33	25	7	6	1	1	328	317
8	257	266	34	25	6	5	3	3	300	299
9	299	260	26	19	4	5	5	3	334	287
10	304	253	18	16	5	6	4	4	331	279
11	265	237	30	20	8	8	1	1	304	266
12	246	248	24	18	6	6	1	1	277	273
13	323	266	32	23	9	8	5	3	369	300
14	328	286	28	20	6	10	1	1	363	317
15	321	269	32	27	7	9	5	4	365	309
16	333	299	25	19	5	5	1	1	364	324
17	347	323	26	24	11	17	1	1	385	365
Province	297	272	27	20	6	7	3	3	333	302

Alberta.- The locker plant industry had developed further in Alberta than in any other province except Ontario by the end of World War II. Interest in building full service locker plants became strong in southern and central Alberta during the war years with the result that the industry was in a phase of rapid expansion even before the end of the war. There were 33 locker plants in operation when the Alberta regulations were approved. Although a number of these plants were of the full service type others, usually the older ones, were partial service plants.

As in Ontario, this situation resulted in some conflict. The regulations instituted were somewhat disappointing to some operators of full service plants in that they did not require that meat should be cut up and wrapped on the premises of the locker plant. However, they insisted on sharp freezing and inspection of food parcels by the locker plant operator before food was placed in lockers. Although operators opposed these requirements at first, all adjusted themselves to them within a reasonable period of time.

The locker plant industry developed earlier in southern Alberta than in other parts of the province (Table 14). In January 1945, over half of Alberta's locker plant facilities were in the four most southern census divisions which have only 16 per cent of the province's population. However, of the lockers in use in locker plants in this area by the end of 1953, 60 per cent had been installed by the end of 1945. The number of lockers installed continued to increase through 1950 but since 1950 has changed little.

Although the number of lockers in frozen food locker plants in the central part of Alberta (Census divisions 5 to 9) was not far short of that in the south in 1945, this area with more than double the population of the south had a far greater potential for expansion. Actually, almost 60 per cent of the lockers in central Alberta at the end of 1953 were installed in the years 1945 to 1948 inclusive. Growth of the industry has continued but has slowed to a point that suggests that the period of expansion will soon end.

In the northern half of the province, on the other hand, growth of the locker plant industry was fairly slow until the end of 1946. During the next four years 67 per cent of the lockers in locker plants built up to the end of 1953 were installed. Since 1950 growth of the locker plant industry has continued in this part of Alberta although at a somewhat slower pace.

The concentration of locker plant facilities remains low in most of northern Alberta as compared with southern and central Alberta or Saskatchewan (Figures 1 and 2). Another area of relatively low concentration of locker plant facilities consists of census divisions 3 and 5. Repeated droughts have brought about a sharp decline in farm population in this area since 1921. Although agriculture has no doubt now attained considerable stability there, it is probable that past difficulties of the basic agricultural industry have discouraged development of the locker plant industry. However, since

there has not been a similar effect in the adjoining parts of Saskatchewan, there may be other reasons for the relatively low concentration of locker plants in this area.

Table 14.- Growth of Locker Plant Industry in Alberta by Region, 1945-1954

Period	Net increase in lockers in use during period							
	South[a]		Center[b]		North[c]		Province	
	number	%	number	%	number	%	number	%
Prior to January 1, 1945	5,449	41	4,841	22	300	2	10,590	20
1945	2,551	19	3,319	15	1,113	6	6,983	13
1946	418	3	3,277	14	1,251	7	4,946	9
1947	1,814	14	2,632	12	2,036	12	6,482	12
1948	1,409	11	4,031	18	3,677	22	9,117	17
1949	589	4	2,028	9	3,018	18	5,635	11
1950	1,269[d]	9[d]	1,357	6	2,525	15	5,151	10
1951	- 231[d]	-2[d]	527	2	1,007	6	1,303	3
1952	419	3	230	1	746	4	1,395	3
1953	- 287[d]	-2[d]	118	1	1,332	8	1,163	2
Total January 1, 1954	13,400	100	22,360	100	17,005	100	52,765	100

a/ Census divisions 1, 2, 3 and 4.
b/ Census divisions 5, 6, 7, 8 and 9.
c/ Census divisions 10, 11, 12, 13, 14, 15, 16 and 17.
d/ Decrease.

Comparison of number of lockers in frozen food locker plants with number of farms by census division reveals a similar picture to Figure 2. In three areas where large numbers of lockers are rented to urban families, namely census divisons 1, 2 and 6, there are more than 1.0 lockers per farm. Although, this is not the case in the Edmonton area, Edmonton is included in the only northern census division with more than 0.5 lockers per farm. In the southern half of the province only census divisions 3 and 5 have less than 0.5 lockers per farm. Thus, it is apparent that the concentration of frozen food locker facilities in relation to population is higher in southern Alberta than in northern Alberta no matter whether farm, rural, or total population is considered pertinent.

Alberta provides quite complete data on the degree of utilization of locker plant services and facilities. The data are similar to those compiled in Saskatchewan but are available for a longer period, namely January 1945 to date.

These data show that the quantity of food processed per locker installed has been higher in the south of the province than in the

north in most years (Table 15). However, since 1949 the difference in pounds of food processed per locker between the high and low region has been less than ten per cent. Moreover, as indicated in Table 14 the net increase in number of lockers in locker plants has been greater in the north than in the south each year since 1946. As the lockers in a locker plant often are not fully utilized for some months or even years after initial installation, this could well be a cause of the difference in volume of food processed per locker between northern and southern Alberta. Similarly, the relatively rapid expansion of the locker plant industry in central Alberta from 1946 to 1949 inclusive, was probably a reason why the quantity of food processed per locker installed during this period was lower in the central than in the southern part of the province.

Table 15.- Quantity of Food Processed per Locker Installed in Alberta by Region, 1945 - 1953

Year	South[a/]	Centre[b/]	North[c/]	Province
	- pounds per locker [d/] -			
1945	236	264	235	249
1946	282	252	188	258
1947	318	290	298	301
1948	328	284	332	308
1949	322	292	313	305
1950	298	275	272	278
1951	280	287	276	280
1952	334	336	323	330
1953	308	307	286	301

a/ Census divisions 1 - 4.
b/ Census divisions 5 - 9.
c/ Census divisions 10-16.
d/ Discrepancies with Table 5 arise from using as number of lockers in this table the average of lockers installed at the beginning and the end of year in lieu of number installed at November 30.

With respect to the relative importance of various products in locker plant processing in Alberta there is no discernible regional pattern. Such variations as arise in individual census divisions from the provincial pattern of 76 per cent fresh meats, ten per cent cured meats, six per cent poultry and eight per cent other products appear to be related to the influence of urban centers rather than to geographic areas.

Since 1947 the total volume of food processed per locker installed 1/ in Alberta locker plants has been fairly stable (Figure 3). Except in 1952, this quantity has varied less than five per cent either way from 295 pounds.

1/ Here and in subsequent discussion the average of the number of lockers installed at the beginning and at the end of the year is taken to represent the number installed.

Figure 3

POUNDS OF FOOD PROCESSED, BY TYPE, PER LOCKER INSTALLED
ALBERTA LOCKER PLANTS 1945 - 1953

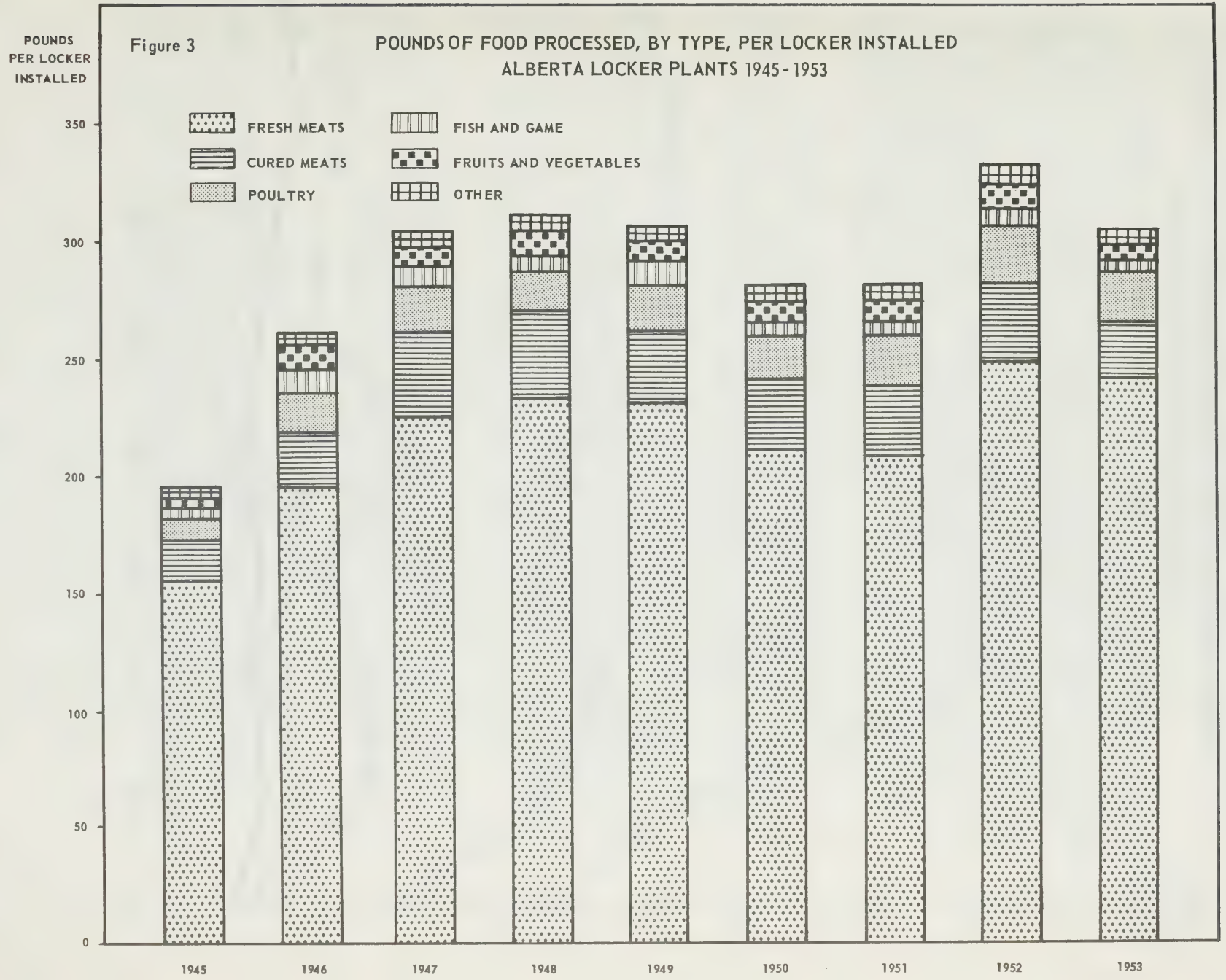
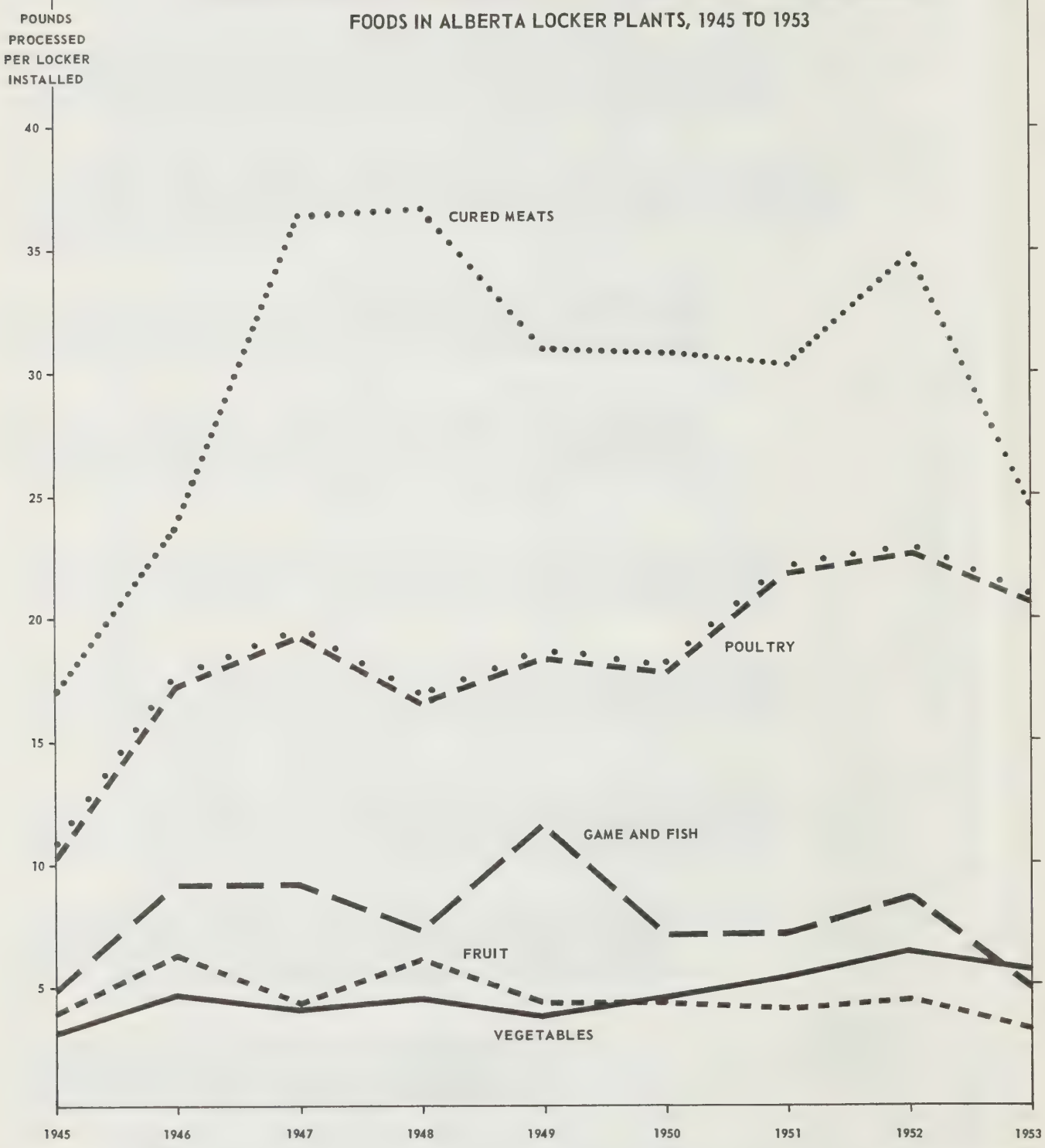


Figure 4

TRENDS IN VOLUME PROCESSED PER LOCKER INSTALLED OF VARIOUS CLASSES OF FOODS IN ALBERTA LOCKER PLANTS, 1945 TO 1953



Moreover, both the direction and size of annual variations have been determined largely by variations in the volume of fresh meat processed. The latter has varied within a range of ten per cent up and down from 228 pounds.

The volume of processing per locker installed is less stable for other classes of food but the average volumes have been relatively so small that variations in total volume from year to year have not been greatly affected. The quantity of cured meat processed per locker ranged from 30 to 36 pounds from 1947 to 1952 but then suddenly dropped 25 pounds in 1953 (Figure 4). The high prices prevailing for pigs in the fall of 1953 relative to cattle and poultry may have caused this decline. Fewer farmers slaughtered pigs for home consumption and consequently locker plant operators were not asked to cure as much meat. There appears to be an upward trend in the volume of poultry processed per locker in Alberta. Active promotion of frozen fish by Alberta locker plant operators led to sharply increased storage of game and fish in 1949, but the level attained that year has not been maintained.

Neither fruits nor vegetables have ever accounted for more than a very minor portion of the locker plant business in Alberta, but the quantity of fruit per locker has been declining while that of vegetables has shown some tendency to increase. The combined quantity of these two classes of food has usually amounted to less than ten pounds per locker.

British Columbia.- Available data do not indicate relative rates of growth of the locker plant industry in various parts of British Columbia but in 1953 over half of all lockers installed in locker plants in this province were concentrated in census division 4, that is the lower mainland. This is not too remarkable in that over half the population of the province resides in the same region. However, as the bulk of this population lives in the metropolitan area of Vancouver and New Westminster, this area does have a heavy concentration of locker facilities relative to rural population (Figure 2).

Greater Vancouver has a total of 23 frozen food locker plants with almost 15 thousand lockers installed. No other metropolitan area in Canada has anywhere near this number of locker plants and lockers. Nevertheless, Edmonton, Calgary and some smaller cities do have more lockers installed in frozen food locker plants per 100 persons than Vancouver.

As a result of the large urban population of the lower mainland even half the locker plant facilities of the province fails to give as high a concentration of facilities in relation to total population as exists in some areas in the interior (Figure 1). However, most of the province has less than five lockers per 100 persons. This is in rather sharp contrast to the Prairie Provinces but is probably accounted for by the more limited importance of agriculture in the economy of British Columbia.

FACTORS AFFECTING DEVELOPMENT OF LOCKER PLANT SERVICES

The foregoing analysis has indicated that the concentration of locker plant services relative to population varies considerably across Canada. In the Atlantic Provinces and Quebec the locker plant industry has remained relatively small and unimportant. In the rest of Canada it grew very rapidly for one or two decades, but present indications are that further expansion will be slow and limited in scale. As a result of the rapid growth in some areas there is a much heavier concentration of locker plant services relative to population in those areas of Ontario and Western Canada than in others. Possibly, this uneven growth has been purely a chance occurrence. On the other hand there may be certain economic forces which have led to the present distribution of locker plant facilities. In this section some appraisal will be made of the following as factors affecting the development of the locker plant industry.

1. The distribution of population.
2. Farm income as reflected by average farm assets.
3. Type of farming.
4. The practices of farmers with respect to slaughtering their own livestock for home use.

The Composition of Population.- Locker plant facilities probably are of less value to urban families than to farm families. If produce stored in the locker is produced by the family which rents the locker there are greater possibilities of realizing cash savings to the locker renter than if the same produce is purchased on urban wholesale markets. Consequently, it might be expected that the number would increase as the percentage of farm population increases.

In Ontario and the four Western Provinces the number of lockers does increase as the percentage of population on farms increases from zero to 50 per cent (Table 16). However, it declines quite rapidly when over 50 per cent of the population is on farms. Thus, it appears that circumstances have been most favorable for development of the locker plant industry where a little less than half the population live on farms.

On the other hand, the size of locker plants as opposed to the concentration of services is largely determined by size of community. The cities have the largest locker plants (Table 17). Here the large concentration of population makes it possible to seek maximum efficiency of scale in operations. Although some firms carry on small scale locker operations in a large city, those which place considerable emphasis on the locker business as a major phase of the firm's operations tend to build relatively large plants.

In towns with populations of 1,000 to 5,000 the potential volume of trade appears to establish an effective limit on locker plant size.

Many such towns support two locker plants, but even where there is only one it is unlikely to be large according to city standards.

Table 16.- Relation between Percentage Farm Population and Number of Lockers per 100 Persons Ontario West

Percentage farm population class	Cenus divisions in class	Total population 1951	Total lockers available 1953	Lockers per 100 persons
- per cent -		- number -		
0 - 10.0	13	3,323,454	69,478	2.1
10.1 - 20.0	21	1,848,496	72,802	3.9
20.1 - 30.0	19	1,042,325	70,135	6.7
30.1 - 40.0	12	522,927	48,603	9.2
40.1 - 50.0	12	363,806	42,215	11.6
50.1 - 60.0	22	675,168	53,273	7.9
60.1 - 70.0	13	419,770	29,546	7.0
Over 70	3	114,576	5,470	4.8

In towns or villages with populations under 1,000, the tendency is to build the smallest sized locker plant which is likely to prove reasonably efficient. In both Alberta and Saskatchewan very small locker plants have been considered unsound business propositions and licensing boards have discouraged the construction of locker plants with capacities below 250 lockers. Some plants smaller than this existed before the introduction of licensing legislation and were granted licenses. Likewise under special circumstances which seemed to give the small plant a good possibility of business success, licenses have been granted. Nevertheless, the average size of locker plant in small centers might have been even smaller in the absence of licensing legislation.

The volume of food processed per locker is lowest in cities with populations over 10,000 and highest in towns and villages between 1,000 and 5,000. Variation in the volume of meat frozen accounts for the greater part of this difference. In fact city locker plants freeze as much or more poultry, fish and game, fruits and vegetables per locker as do those in towns with populations of between 1,000 and 5,000. City locker plants also lead in the volume of meat smoked or cured per locker.

It is difficult to judge the relative use of locker plant services by farm and non-farm families from these data. Locker plants in all categories serve families of both classes although the proportion of non-farm families served tends to increase as the size of center increases. Thus, it is probable that the difference in usage of locker plant facilities between farm and non-farm families is at least as sharp as that between families in the smallest and largest community classes of Table 18.

Table 17.- Comparison of Business of Locker Plants in Various Sized Centers in Alberta and Saskatchewan, 1953

Size of center	Locker plants	Lockers per plant	Food Processed: Fresh meats	Smoked or cured meats	Poultry	Game & fish	Fruits	Vegetables	Other	Total
	- number -		- pounds per locker -							
Over 10,000	26	776	177	26	26	7	4	5	3	248
5,001 - 10,000	7	724	252	23	17	8	2	4	1	307
1,001 - 5,000	67	420	279	24	19	5	3	5	6	341
1,000 and under (Alberta)	96	243	257	23	17	4	2	5	3	311
1,000 and under (Saskatchewan)	164	271	252	14	13	5	3	3	3	293

Table 18.- Relation between Farm Assets per Farm within Groups of Census Divisions Classified by Percentage of Population Living on Farms, 1951, and Number of Frozen Food Lockers per 100 Persons, 1953, for Ontario and Western Provinces

Population class and assets per farm	Number of census divisions in class	Total population	Total number of lockers	Lockers per 100 persons
20 per cent farm population & under				
Assets per farm $10,000 and under	8	523,437	7,343	1.4
" " " $10,001 - 15,000	9	521,748	20,469	3.9
" " " $15,001 - 20,000	9	2,032,252	69,453	3.4
" " " over $20,000	8	2,094,513	35,015	2.2
20.1 to 40 per cent farm population				
Assets per farm $10,000 and under	3	57,173	894	1.6
" " " $10,001 - 15,000	10	384,685	21,725	5.6
" " " $15,001 - 20,000	8	518,086	40,233	7.8
" " " over 20,000	10	605,308	55,886	9.2
40.1 to 50 per cent farm population				
Assets per farm $10,000 and under	1	17,740	200	1.1
" " " $10,001 - 15,000	3	56,334	2,567	4.6
" " " $15,001 - 20,000	5	192,244	25,737	13.3
" " " over 20,000	3	97,484	13,711	14.1
Over 50.0 per cent farm population				
Assets per farm $10,000 and under	0	0	0	0
" " " $10,001 - 15,000	12	367,366	18,393	5.0
" " " $15,001 - 20,000	17	569,214	45,996	8.1
" " " over $20,000	9	272,934	23,900	8.8

Farm Assets.- In view of the relation outlined in the previous section, between number of lockers in locker plants per 100 persons and percentage farm population, the effect of the prosperity of the farming area on concentration of locker plant facilities is best evaluated when areas are grouped according to the proportion of population living on farms. Although net income per farm family over a period of several years is the best measure of relative prosperity of agricultural areas, the use of such data for any specific year can be quite misleading in that agricultural incomes are highly variable from year to year. However, the accumulation of farm assets reflects to a considerable extent the income earned over a period of time. Consequently, assets per farm, as reported in the 1951 census, were chosen as the most satisfactory criteria to evaluate the effect of relative farm prosperity on the locker plant business. On the basis of these criteria there is a definite tendency for the concentration of locker plant services to be greatest where agricultural incomes have been highest (Table 18).

Although the data of Table 18 are limited to the five provinces where the locker plant has developed furthest, it is certain that inclusion of figures for the other five provinces would not greatly modify the picture presented. Available information indicates that there are few, if any, census divisions in the remaining five provinces which have more than two or three lockers installed in frozen food locker plants per 100 persons of total population. Likewise, nearly all the census divisions in these five provinces had farm assets of less than $10,000 per farm in 1951. On the other hand, the value of farm assets per farm does not appear to have any relation to the volume of food processed per locker.

Type of Farming Area.- There probably is some relation between the type of farming area and the use of locker plant services. Nevertheless, this relation is not necessarily one of increasing use of locker services with increasing importance of livestock in the economy. Even in specialized wheat growing areas there are usually enough livestock produced to supply the meat requirements of the farm population.

Actually, so far as Alberta and Saskatchewan are concerned, locker plant services have developed furthest in the wheat areas.1/ (Table 19). These areas have the most frozen food lockers installed in locker plants per 100 persons and compare satisfactorily with other type of farming areas in the volume of food processed per locker.

As general grain farming areas are similar to wheat areas in the relative importance of field crops, it might be expected that the concentration of locker plant services in them would be quite similar to that in the wheat areas. In Saskatchewan this is so, but in Alberta the general grain areas are confined to the Peace River block, and include several districts that are in the early stages of agricultural development. Thus in Alberta the concentration of locker plant services in the general grain areas is relatively low.

In the cash crop - livestock areas, sale of grains is predominant over the sale of livestock but accounts for less than 70 per cent of the farm income. The number of lockers per 100 persons is between ten and 20 per cent lower than in the wheat areas in both Alberta and Saskatchewan. Although a slightly higher quantity of food is processed per locker, the quantity of food processed per person in the cash crop - livestock areas is ten per cent lower in Alberta and 15 per cent lower in Saskatchewan than in the wheat areas.

In the livestock-cash crop area livestock are more important than grains as a source of farm income. In such areas, the concentration of locker plant services is much lower than in grain areas and the quantity of food processed per locker somewhat lower.

In the livestock-general areas livestock products are the source of over 70 per cent of the farm cash income. Here the concentration of locker plant services is considerably lower than in any other type

1/ By definition, over 70 per cent of farm income in the wheat areas is derived from grain of which over 40 per cent is derived from wheat.

Table 19.- Characteristics of Locker Plants by Type of Farming Areas, Alberta and Saskatchewan, 1953

Characteristic	Unit of measurement	Province	Type of farming area[a]				
			Wheat	General grains	Cash crop - livestock	Livestock - cash crop	Livestock general
Population of area[b] 1951	No.	Alberta	51,822	25,578	84,218	237,399	152,060
		Sask.	228,212	139,746	236,478	18,823	8,615
Lockers per 100 persons	No.	Alberta	10.1	4.7	9.0	7.5	5.2
		Sask.	10.2	8.6	8.1	3.4	[c]
Lockers per plant	No.	Alberta	214	243	271	331	337
		Sask.	306	280	273	203	-
Food processed per locker	lb.	Alberta	326	297	331	314	325
		Sask.	322	355	350	303	-
Food processed per person	lb.	Alberta	33.1	14.1	30.0	23.7	16.9
		Sask.	32.9	30.6	28.1	10.2	-
Proportion of food processed total meats	%	Alberta	90	90	88	90	90
		Sask.	90	90	92	93	-

[a] Income data obtained in the 1951 census were used to clasify municipalities into types of farming areas. For purposes of this table, livestock specialty areas have been combined with the general livestock area. Grain is equally predominant in the wheat and general grain areas. Otherwise the areas are arranged in order of increasing importance of livestock as a source of farm income.

[b] Total population less that within cities with populations over 10,000 and within 15 miles of their borders.

[c] Only one locker plant in this type of farming area.

of farming area in Alberta. As such areas in Saskatchewan are small and include only one locker plant, the data of that province cast little light on the concentration of locker plant services in livestock areas.

Thus there is a distinct pattern of association between the concentration of locker plant services and the relative importance of cash crops, especially wheat, in the farm economy. This analysis holds true for Alberta and Saskatchewan but may not apply to other provinces. In Alberta and Saskatchewan the wheat growing areas generally have a highly commercialized agriculture and high assets per farm. Parts of the livestock areas are devoted to ranching and have scattered population; the remainder consists of regions where farms are relatively small and assets per farm are low. Thus, the basic relation may be due to effects of concentration of population and farm income rather than to those of relative importance of livestock and grain in the farm economy.

Aside from the relation with concentration of locker plant services, type of farming area does not appear to have a marked effect on the locker plant business. Variations in volume of food processed per locker are too small to suggest an important difference in the degree of utilization of locker plant services. Meat is equally dominant among foods processed by locker plants in all types of farming areas.

Slaughter of Livestock for Home Use.- A wide variation in the slaughter of livestock for home use per farm by census divisions and some tendency for the concentration of locker plant services to increase with the quantity of livestock slaughtered for home use was found in this study. Such a tendency could arise from either of two causes. Well-established habits of slaughtering livestock for home use may help to make an area attractive for the establishment of a locker plant. On the other hand, accessiability of locker plant services may induce farmers to slaughter livestock which they would otherwise market. Thus more lockers per 100 persons in areas with heavier slaughter of livestock for home use than those with less such slaughter of livestock does not necessarily mean that farm practices in this connection have been an important factor in determining the location of locker plants.

IMPORTANCE OF LOCKER PLANTS AND HOME FREEZERS IN FOOD MARKETING

Although the foregoing analysis has discussed locker plants alone, a new household appliance, the home freezer, has appeared in recent years as an important factor in the handling of frozen foods. Unfortunately, data on the use of home freezers are very limited.

Number of Home Freezers in Use.- Although a few home freezers may have been in use before 1939, they did not gain much of a market until after World War II. Then for a few years appliance manufacturers were having difficulty in satisfying the backlog of demand for refrigeration equipment and consequently sales of this new, little known electrical appliance were not aggressively promoted until about 1952.

The number of home freezers in use in Canada is estimated to have more than doubled in the last three years on the basis of household sample surveys conducted by the Dominion Bureau of Statistics (Table 20). Ontario is the province with the most home freezers in use, and is followed by Quebec. Nevertheless, both lag behind the four Western Provinces in percentage of homes having home freezers. In the latter regard Saskatchewan leads, followed by Alberta. However, even in Saskatchewan only ten per cent of all households had home freezers in September 1955. For all Canada this proportion is five per cent.

Table 20.- Number and Percentage of Households in Specified Provinces and all Canada with Home Freezers in September, 1935-55 a/

Province	1953	1954	1955	1953	1954	1955
	- thousand -			- per cent -		
Quebec	13	21	34	1	2	3
Ontario	24	52	68	2	4	5
Manitoba	9	11	15	4	5	6
Saskatchewan	5	8	24	2	4	10
Alberta	10	20	23	4	7	8
British Columbia	17	23	24	5	6	6
CANADA	81	138	191	2	4	5

a/ Based on tables in "Household Facilities and Equipment" published by the Dominion Bureau of Statistics each year since 1953. No individual estimates are made in this report for the four Atlantic Provinces, although they are included in the Canada estimate. Households in the Yukon, the Northwest Territories and of Indians on Reserves are excluded.

There is considerable variation in the capacity of home freezers. Commercial models range from about three to 24 cubic feet, with 12 to 16 cubic feet probably the most popular sizes. There are a few home made and custom built farm and home freezers. These are usually larger than the commercial models and range up to 100 cubic feet or more. Thus an estimate of 12 cubic feet average capacity would appear to be quite conservative. On this basis the storage capacity in freezers installed in Canadian homes now is about 2.3 million cubic feet. This capacity appears to be increasing at a rate of about 50,000 cubic feet per month . The holding capacity provided for frozen foods in domestic refrigerators which probably exceeds that in home freezers is not included in the foregoing figures.

The estimated 420,000 lockers installed in Canadian locker plants may be assumed to have a capacity of about 2.6 million cubic feet. Thus the capacity of home freezers is now approaching that of locker plants and at the present rate of development will exceed that of locker plants by 1957.

The Food Plan.- The rapid expansion in the use of home freezers has been sparked by Canadian prosperity and the development of the "food plans" as a technique in selling them. A food plan involves an agreement to supply frozen foods to the buyer of the home freezer at prices which purport to be lower than usual retail prices. The buyer of the home freezer usually is under no obligation to buy any food under the food plan. On the other hand, food plan operators usually refuse to sell frozen foods to anyone who has not bought a freezer from them. Some make an exception to this practice for anyone who owned a home freezer before the food plan was set up, or who bought a home freezer under a food plan which is no longer in operation.

The first food plans in Canada commenced operation in Alberta and British Columbia in the late summer of 1952. The apparent initial success of the first ventures in this field induced quite a few businesses to develop food plans, especially in Vancouver. In the latter city a number of the food plans were unsuccessful business undertakings and discontinued operations within a year or two. This deprived their customers of their source of supply of low priced frozen foods although they were obligated to carry on payments on their freezers. These developments appear to have checked the sales of home freezers in British Columbia as evidenced by the slow increase in the number in use from September, 1954 to September, 1955 (Table 20).

Fewer firms sold food plans in other provinces in 1952 and 1953 and a smaller proportion of such firms have discontinued business. Meanwhile there has been a rapid increase in the number of home freezers in use.

Relation between Locker Plants and Home Freezers.- Development of the food plan and the aggressive selling of home freezers have had a considerable impact on the locker plant industry. It is readily apparent that a family in any type of community which owns a home freezer has less need of renting a locker in a frozen food locker plant than one which does not. Moreover, a family which has become accustomed to the use of frozen meat through locker plant services, and is convinced that the use of locker plant services saves it money may be more likely to buy a home freezer than a family which is skeptical of the quality of frozen foods and of the value of locker plant services.

Many of the more successful locker plant operators, especially in the larger urban communities, have converted their businesses into "frozen food centers". What this has involved is primarily a shift in emphasis from serving locker renters to the merchandising of frozen foods. A total of 143 locker plant operators replied to a mail questionnaire circulated in 1955.1/ Of these 143 locker plant operators 131 were retailing brand name frozen foods, 60 were wholesaling frozen foods and 42 were selling home freezers and food under food plan arrangements.

1/ This survey was undertaken by the editor of the publication "Locker Plants and Frosted Foods," Gardenvale, P.Q., and its findings are used through his courtesy.

The shift to frozen food merchandising has made additional demands on the freezing and storage capacity of locker plants. To meet these requirements some Alberta locker plant operators were removing lockers from their plants as early as the summer of 1953. More recently some locker plant operators in the larger cities of other provinces have done likewise.

Some locker plant operators, especially those who have been reluctant to adjust their business operations to changing conditions, have lost business as a result of increased use of home freezers in their communities. This circumstance has occurred most often in smaller centers following aggressive promotion plan in these areas by some firm other than the local locker plant. Thus, even in the smallest centers the development of the food plan has placed pressure on the locker plant operator to become a more aggressive merchandiser of frozen foods. He has been encouraged to do so by the locker plant associations and particularly by American trade journals.

Yet the locker operator who shifts to processing foods for home freezer owners and increased merchandising needs to carefully review his price schedules. A recent American study reveals that many locker plant operators may be cutting, wrapping and freezing meat at a loss, which in normal locker plant operations is offset by profits on locker rentals.1/

Impact on Meat Industries.- In general, the development of locker plants and home freezers has had only a minor impact on the marketing of meats to date. Most locker plants have been set up in market towns to serve farming communities. In such communities, prior to to the establishment of the locker plant, many farmers slaughtered livestock to provide their own meat. The butcher may also have operated a slaughterhouse and secured local livestock for a large proportion of his meat requirements. Thus, the establishment of a locker plant seldom had much effect on the community's purchases of meat from packing plants. According to sales managers of packing plants, their sales have decreased in some communities but increased in others following the establishment of a locker plant. It is, of course, probable that in the absence of development of the locker plant industry, the period following the end of World War II would have brought a strong shift toward purchase of packing plant services in rural communities. The practice of farm slaughter of livestock becomes less attractive when farmers are prosperous than when they are short of money.

Until the advent of food plans the purchase and construction of farm and home freezers were too scattered to have a perceptible effect on meat marketing patterns.2/ Probably most such installations

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1/ Wilkins, Paul C., and L.B. Mann, Operating Costs of Selected Frozen Food Locker Co-operatives, Farm Credit Administration, U.S. Department of Agriculture, Bulletin 71, March, 1953.

2/ Probably the first sizeable home storages for frozen foods were built to order on farms and ranches. Thus this appliance is often called a farm freezer.

occurred in those rural communities where hydro power was available. Usually there would be a locker plant in the community and storage of meat in the home freezer appeared as an alternative to storage in the locker plant rather than to purchase of meat in the butcher store.

Most food plan operators buy meat direct from packing plants and either cut, wrap and freeze it in their own plant, or have these services carried out on a custom basis in a locker plant. Thus, so far as the packing plant is concerned, the food plan operator merely becomes another customer. He buys on the same terms as large scale retailers.

In the opinion of sales managers of packing plants there is little difference in the buying practices of food plan operators and retail butchers. Choice among various grades of beef appears to be influenced to a considerable degree by price differentials; almost all purchases of meat grade top commercial or better. At times, food plan operators have been able to take advantage of a temporary surplus in a particular quality of carcass or in front or hind quarters to obtain meat at reduced prices. Similar prices have been available to other buyers, but retail butchers have been more limited as to quantities they can safely buy in view of the perishability of fresh meats.

Impact on the Frozen Food Industry.- As with the business of meat packers, the development of locker plants had little effect on that of commercial packers of frozen foods. The locker plant customer, to the extent that he used frozen fruits and vegetables, generally had his own garden produce frozen. As very few such customers had previously purchased frozen foods, other than fish, these home grown products had no direct effect on the sales of commercial products.

Some locker plant operators have promoted the sale of commercially packed frozen foods, especially fish. But, as the sales of commercially packed frozen foods in most locker plants have been quite small, the effect on the frozen food industry has not been very significant.

The indirect impact of the development of the locker plant industry has probably been more beneficial to frozen food packers. Thousands of families have learned about the quality of frozen fruits and vegetables through the use of locker plant services. This may have been an important factor in increasing the demand for frozen foods.

The development of the food plan, however, had a direct impact on the frozen fruit and vegetable industry. In 1952, before food plans had developed far enough to have a significant effect, the average Canadian family consumed 1.2 pounds of commercially frozen fruits and vegetables per person. The food plan operator usually sells about 50 pounds of frozen fruits and vegetables in the initial food order, with an expectation of a re-order in three to six months. Estimates of average purchases of frozen fruits and vegetables by "food plans" customers given by firms in this business range from 150 to 300 pounds a year. Even the lowest of these figures is about 25 times as great as the consumption of frozen fruits and vegetables by the average Canadian family. Consequently, with an increase of over

100,000 in the number of home freezers in use in two years many of them sold under food plans, the sale of home freezers has become an important factor in increasing the demand for frozen fruits and vegetables. Apparent domestic disappearance of frozen fruits and vegetables in Canada more than doubled from 1952 to 1954. Food plan sales represented a substantial portion of this increase.

The home freezer has also had an indirect effect on frozen food sales. Most buyers of home freezers have become very enthusisastic about the merits of frozen foods. Thus, home freezer owners have had considerable influence in causing others to become interested in frozen foods.

Impact on Retailers.- As previously noted most locker plants have been established in market towns serving farming communities. In many instances it was the only meat retailer, or else one of few meat retailers in the town, who set up the locker plant business. In such cases the building of the locker plant was a means of expanding the individual butcher's business. Competing meat retailers. if any, probably lost some business. However, much of the locker plant operator's gain in business came from persuading farmers to buy locker plant services as a means of improving quality and reducing waste in the home produced meat that they would use in any event. Thus, the establishment of a locker plant by an established meat retailer did not necessarily have any marked effect on the business of competing butchers.

Where the locker plant was established by someone who was not previously retailing meats in the community the situation was different. Then, the competing butcher almost inevitably lost some business just as he would have done with the establishment of an added meat market. Also, the possibility of establishing the locker plant mainly on the new business of farmers who used home produced meats made practicable the establishment of a locker plant in competition with a meat market in towns where the business wasinsufficient to warrant two ordinary meat markets.

In this connection, it may be added that the development of the locker plant industry has been the means of bringing meat retailing services to some communities that would not have these services without a locker plant. Although the prime functions of a locker plant business are to supply meat cutting, wrapping, freezing and storage services to individual families, the great majority of locker plant operators have also retailed meats for some years. In many smaller centers the locker plant operator is the only retailer of fresh meats.

The home freezer has probably had its greatest impact on retailing in urban and suburban areas. The food plan is based on the concept of the home freezer buyer shifting about 40 per cent of his food purchases to the source designated by the home freezer supplier. Thus, the sale of food plans to a large proportion of families in a city would have a great impact on food retailing, especially of meats, fish poultry and other frozen foods. Indirect effects may well be felt in the retailing of canned foods and possibly other lines. To meet

this threat some large scale retailers have run newspaper advertisements demonstrating that their mark-up on retail meats are too small to allow room for the large savings claimed by food plan operators. At least one large scale retailer introduced a plan for a discount on quantity purchase of perishable foods and also offered water-vapor-proof wrap and freeze meat bought under this plan. It became possible for at least short periods to buy a quarter or side of beef in a retail store and have it cut to specifications and delivered at a very reasonable mark-up over packers' prices.

Actually, in the long run the shift in the buying practices of the home freezer owner is not as great as might be expected. Bitting found that per capita purchases of frozen peas in 1952 by families who owned freezers throughout 1952 were only slightly greater than those of families who owned refrigerators with frozen food compartments.1/ With frozen whole kernel corn and orange juice concentrate the freezer owners purchases were actually the lower of the two groups. Among families with an income under $3,000, a smaller percentage of those who owned freezers than of those who owned refrigerators with frozen food compartments were buyers of 12 out of 15 of the more common frozen food items. Only frozen broccoli, orange juice concentrate and chicken parts were bought by a larger proportion of freezer than refrigerator owners. Probably some of the families who owned home freezers froze their own produce instead of buying frozen foods. Bitting does not indicate whether any of these families were buying frozen foods under food plans , but it is unlikely that such results could have occurred if active food plan participants constituted a large proportion of the freezer owners in the sample.

In February 1954 data on purchases of certain foods were obtained by the Ontario Agricultural College from a sample of families in Kitchener and Guelph who had bought home freezers under food plans at least six months earlier. It was found that most of these families purchased elsewhere some meat and other foods for which the equivalent could be bought under the food plan. Thus, it is apparent that purchase of a home freezer under a food plan does not necessarily mean that the buyer has swung permanently to the use of frozen foods exclusively in lieu of their canned or fresh equivalents. This pattern may be formed during the first few months but as time goes on, a balance will be maintained based on the buyer's judgment of relative value received for money spent on frozen, canned, cured and fresh categories of the same food class. All are likely to be used to some extent. As the home freezer enables its buyer to hold large quantities of frozen foods, the home freezer owner will usually be interested in opportunities to reduce his food expenditure through quantity buying of those foods which can be stored in the freezer. Increased sales of home freezers will increase the opportunities for bulk selling of these foods. Firms specializing in retailing frozen foods in relatively large units may prove most efficient in catering to the requirements of the home freezer owner. The share of the trade with respect to filling of home freezers likely to be gained by sales

1/ Bitting, H.W., "Purchases of Frozen and Canned Foods by Urban Families as Related to Home Refrigeration Facilities", United States Department of Agriculture, Agricultural Marketing Service, Washington, D.C. 1954. p.7.

in large units is suggested by a recent American study on contents of home freezers.1/ This study indicated that one quarter of freezer owners replenish their frozen food supply weekly and one half replenish it every three months or less often.

SUMMARY

1. The locker plant industry in Canada had its origin about 30 years ago, but its phase of most rapid development occurred between 1944 and 1950. Since 1950 expansion has continued at a decreasing rate with indications that there will be little future increase in the number of lockers available for rental.

2. In each of the five provinces where the locker plant industry has gained considerable size, the industry has come under the regulation and licensing of provincial government authorities. The main purpose of regulation has been to ensure the maintenance of satisfactory sanitary standards and that locker plants will be operated in such a manner as to preserve adequately the quality of food placed in them. Protection of the locker operator's investment by discouraging undue expansion of the industry in small communities has been a secondary purpose in some provinces. Regulatory legislation has generally been sponsored by associations of locker plant operators.

3. There are over 1,200 locker plants in Canada. Over 500 of these are in Ontario and over 200 in Saskatchewan. British Columbia, Alberta and Manitoba each has between 100 and 160 locker plants. Relatively few plants are located in Quebec and the Atlantic Provinces.

4. It is estimated that these locker plants include about 430 thousand frozen food lockers of which about 85 per cent are rented to the general public at any one time. Probably about ten per cent of Canada's population are actually using frozen food locker plant services.

5. It is estimated that Canadian locker plants now process or store over 110 million pounds of food a year of which about 80 per cent is frozen meat other than game or poultry and five to ten per cent cured meat. Poultry meats are the next largest in volume of foods processed in locker plants.

6. November and December are the busiest months for the locker plant firm at least in Alberta and Saskatchewan. About half the poultry processed and more meat than in most months, is received in November and December.

7. There are about 30 locker plants scattered across the four Atlantic Provinces. Most of these are associated with other businesses.

1/ The article "What's in the Nation's Freezers". Frozen Food Center, October, 1955, pp.20-26 presents the major findings of this study.

8. The Quebec Government owns and operates about 50 cold storage warehouses established to promote the fishing industry. Nearly all of these include some lockers for rental to the general public. In addition, there are 35 privately owned locker plants.

9. The highest concentration of locker plant services in Canada occurs in portions of southwestern Ontario. Here the locker plant industry had developed to about one-third of its present scale before World War II and had stopped expanding by 1950. Most of the older locker plants are operated in conjunction with dairy, creamery or general cold storage businesses and of the newer plants in conjunction with meat markets. Only about 15 per cent of the locker plants in Ontario are independent of other businesses.

10. The development of the locker plant industry in Manitoba is somewhat more recent than in Ontario, but expansion has been very slow since 1951. Locker plants are distributed with reasonable uniformity throughout the agricultural areas of the province.

11. Prior to 1947 Saskatchewan probably had fewer locker plants than any other province. It now has more locker plants per thousand of population than any other province. Locker plant services are distributed with surprising uniformity throughout Saskatchewan, and are unlikely to expand much further.

12. The locker plant industry had developed in southern Alberta to a similar extent as in southwestern Ontario by the end of World War II. Since then expansion has come mainly through establishment of locker plants in new areas. Nevertheless, the northern portion of the province still does not have as heavy a concentration of locker plant services relative to population as the south.

13. Over half the population of British Columbia lives in the lower mainland in which over half the locker plants in the province are situated. There is a lower concentration of locker plant services relative to population in British Columbia than in the Prairie Provinces which is probably due to the lesser importance of agriculture in the former area.

14. Although locker plants are usually built in large villages, towns or cities they tend to be most heavily concentrated in census divisions where 40 to 50 per cent of the population live on farms. Moreover, so far as can be determined from available data, locker plants in cities over 10,000 do less business per locker than do those in smaller centers.

15. Locker plants are generally quite scattered in all sections of Canada where farm assets are below $10,000 per farm. Concentration of locker plant services shows a definite tendency to increase as farm assets increase.

16. In Alberta and Saskatchewan the wheat type of farming areas have the

highest concentration of locker plant services. The livestock areas generally have the lowest concentration of locker plant services. However, this is probably caused by differences in assets per farm and concentration of population rather than by the nature of the leading products.

17. There were 191,000 home freezers in use in Canada in September 1955. Food plans have been an important factor in hastening home freezer sales.

18. Although increased sales of home freezers are undoubtedly an important deterrent to the construction of new locker plants, the established locker plant operator usually can expand his business by placing more emphasis on merchandising frozen foods.

19. Neither locker plants nor home freezers have as yet had much impact on the meat packing industry and its practices. Probably the main effect of locker plants has been to check a trend for farmers to shift from the use of home produced to packing house meats.

20. The heavy sales of home freezers have given a strong stimulus to the market for frozen foods, especially fruits and vegetables.

21. As the food plan establishes a new type of retailing, food retailers feel some effect from food plan operations in cities where home freezer sales are large. The home freezer has probably made possible lasting success for firms specializing in volume retailing of frozen foods.